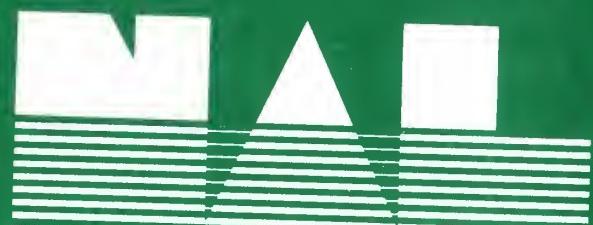


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APPENDIX B
to the
RECORD OF DECISION

Final Environmental Impact Statement
on
Management for the Northern Spotted Owl
in the National Forests

RESPONSES TO COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT
FROM PLAINTIFFS AND INTERVENORS
IN SEATTLE AUDUBON SOCIETY, ET AL. V. EVANS, ET AL., NO. 89-160WD.

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Reply - The Scientific Panel's report (Johnson et al. 1991) did not discredit the "Initial Jack Ward Thomas Report of May 1990 (the ISC Report adopted as Alternative B.) The Scientific Panel rated the ISC Strategy (which it examined as Alternative 4, ISC + FP) as providing a "High" to "Very High" probability of viable spotted owl populations (Johnson et al 1991:31).

As indicated in the "Introduction" to the "Management of Other Resources" on page L-A-3 in the FEIS, this EIS is narrowly focused on the viability of the northern spotted owl. This response notes: ""This environmental impact statement is narrowly focused on a management plan to ensure the viability of the northern spotted owl. Many reviewers who commented on the EIS wanted the scope of this document broadened to consider the management of other forest resources. The FEIS continues with the same scope, proposed action, and purpose and need that were in the DEIS.

"This does not close the door on future consideration of the management for issues for old-growth, old-growth associated species, water quality, or fish stock viability. The land and resource management planning process set up by NFMA assures that such issues will be reconsidered at specified, periodic intervals, as well as when conditions indicate they should be examined or reexamined."

The ISC Report is acknowledged as scientifically credible. It is addressed in the response to the first comment on page L-A-23 of the FEIS which states: "The ISC Strategy for the Northern Spotted owl is scientifically credible for several reasons. First, the scientific method was used to develop the strategy. Strategies were tested and adjusted with the best available quantitative data and other information including modeling. Second, each member of the committee had credentials, experience, and reputations appropriate to the task. Third, published literature, reports and ongoing research was reviewed and considered when developing the strategy. Finally, the report was subject to thorough peer review by professionals selected by the following societies: The Wildlife Society, Society of American Foresters, Society for Conservation Biology, The American Ornithologists' Union, and The Ecological Society of America (USDA Forest Service 1991a Question #15)"

Further, this issue is addressed in the response to the 1st comment on page L-A-16 of the FEIS which states: "The DEIS and the FEIS both display the environmental effects of the alternatives on existing old-growth stands and associated wildlife species, and it was one of the elements used in comparing the alternatives. Developing and presenting an alternative to manage ecosystems or resources not directly tied to management for the northern spotted owl is outside the scope of this environmental impact statement".

[*L4] As such, we believe the agency must develop, analyze, and eventually adopt an alternative that gives protection to the areas in Alternative 12 (Option C management) outlined by the Scientific Panel mentioned above. Not to do so is to fail to take into account the relevant scientific information and opinion available at the time of making this significant agency decision.

Reply - All relevant scientific information and opinion was taken into account in preparing the EIS and recommending the preferred alternative. This information is presented throughout the EIS and is catalogued in the

Bibliography to the FEIS, Appendix D of the FEIS ("Annotated Bibliography"), and in the Administrative Record. The issue is further addressed in the response to the second comment on page L-A-26 of the FEIS which states: "The preparation of this EIS included a review of relevant scientific studies that have been published or are still in progress since the ISC published its Conservation Strategy. Appendix D, Annotated Bibliography, provides a summary of published and unpublished reports reviewed. No conclusions on spotted owl biology or habitat needs were changed from the ISC Report after reviewing this literature.

"New information from ongoing studies in northern California and the east side of the Washington and Oregon Cascades might help clarify habitat use and characteristics in these provinces after these studies are completed, analyzed and peer reviewed.

"In addition, northern spotted owl habitat acres were updated in this document to represent the most recent information from each National Forest.

This issue is also addressed in the Introduction to "Major Additional, or Modified, Alternatives" on page L-A-12 of the FEIS which states: "During the comment period many people and organizations offered ideas for new, different, or modified alternatives. They included suggestions for changes in the general management of the National Forests, site-specific changes to boundaries of HCA's and standards and guidelines, sub-regional forest management strategies, the reexamination of Forest Plans for all or specific resource management, and suggestions for major policy or legislative changes. Others requested alternatives that, in the DEIS, were considered but eliminated from detailed study.

"As noted in Chapter 1, this environmental impact statement is sharply focused on providing management direction that will ensure the viability of the northern spotted owl. Many requests would require more time than the injunction established, or greater authority than the Forest Service has. This environmental impact statement responds to the need for management direction on National Forest throughout the range of the Northern spotted owl. Requests to consider site-specific modifications or special sub-regional management strategies are too limited in scope for inclusion in this programmatic environmental impact statement.

"Many of the alternatives suggested are ideas that should be explored in other contexts. Some should be raised as Forest Plans are completed, amended, or revised. Others would have to be examined in the research and monitoring of spotted owl populations, habitat, and habitat management. Others can be addressed in the process of making minor adjustments and clarifications as these standards and guidelines are implemented. And some would require the revision of Federal law".

It is also addressed in the responses to the first and second comments on page L-A-16 of the FEIS, which state: "THE DEIS and the FEIS both display the environmental effects of the alternatives on existing old-growth stands and associated wildlife species, and it was one of the elements used on comparing the alternatives. Developing and presenting an alternative to manage ecosystems or resources not directly tied to management for the northern spotted owl is outside the scope of this environmental impact statement.", and

"This type of alternative was considered but eliminated from detailed study in this environmental impact statement. See that section at the end of Chapter 2."

[*L5] 4. While presented in a well-reasoned manner, the timber industry proposal that was recently distributed to reviewers lacks the scientific evidence to support its management prescriptions. Much of the available statistical evidence in fact does not support their analyses, which are based in large part on superficial, anecdotal accounts and arm-chair suppositions.

Reply - The environmental consequences of the industry Multi-Resource Strategy was analyzed as Alternative E in the FEIS using the same methodologies and data as were used in analyzing Alternatives A through D.

[*L6] Clearly, their proposed management plan is a factually unsupported, large-scale experiment in ecological manipulation, which if wrong would mean continued loss of biological diversity of the forests critical for their long-term productivity. The Forest Service has ongoing studies of habitat manipulation and restoration in progress at several experimental forests and other lands region-wide. The stand management notions presented by the timber industry deserve small-scale exploration at these isolated locations in the region. The overall, landscape-level plan put forth by the industry must be rejected in toto due to lack of current scientific credibility.

Reply - The industry Multi-Resource Strategy as not recommended as the preferred alternative in the FEIS.

[*L7] We must remember that region-wide, fragmentation-based clearcutting was also an experiment that has shown clear failure in maintaining diversity of wildlife production and mixed results in timber production, as we continue to see estimates of sustainable cut-levels revised downward consistently due to over-optimistic predictions. This is no time to embark on another hair-brained, half-baked (excuse the strong statements) management scheme aimed at maintaining short-term timber production when the natural forests are stressed to near breaking point in the region (as per comments regarding East-Side forests by the Forest Service and the demise of West-Side species such as coastal salmon, marbled murrelet, and the northern spotted owl).

Reply - This issue is addressed in the response to the fourth comment on page L-A-9 of the FEIS which states in part: "The Forest Plans as developed in Region-6 and being developed in Region-5 adequately consider and provide for this diversity of plant and animal communities. Since the Forest Plans remain in effect, with additional protection for spotted owl habitat, the diversity of communities is assured." Further, downward revisions of allowable sale quantities have not been necessitated because of 'over-optimistic predictions', but because of changes in the mix of resources objectives and the resultant reduction in the number of acres managed primarily for timber production.

[*L8] 5. The comments above are offered in addition to those submitted by the Sierra Club Legal Defense Fund in our name that question the adequacy of the current EIS process.

Reply - This comment does not lend itself to a specific response.

RESPONSE TO COMMENTS FROM NATIONAL AUDUBON SOCIETY

The following are comments received from the National Audubon Society on the Draft Environmental Impact Statement on the Northern Spotted Owl, dated December 23, 1991. Each comment is numbered and is followed by a response.

[*C1] The National Audubon Society and its Pacific Northwest chapters have been working to protect the northern spotted owl and its ancient forest habitat for well over a decade. We funded and published the first comprehensive evaluation of the ecology and status of the northern spotted owl in 1986. This report by an independent panel of experts also recommended a broad conservation strategy.

Reply - This comment does not lend itself to a specific response.

[*C2] We submitted extensive comments on the Draft Supplemental EIS in 1986 and the Final Supplement in 1988. These comments mark our third attempt to critique Forest Service analyses, introduce new data, and propose management solutions which meet legal requirements. The most obvious improvement since 1986 is that the number of owls on the EIS covers has increased from one to two to three.

Reply - This comment does not lend itself to a specific response.

[*C3] There have been improvements over this decade, but not in response to our comments, and not because of the Service's response to the NEPA process. The current EIS notes that the Forest Service is preparing it to comply with a court order. We are pleased that the alternatives draw heavily from work of the Interagency Scientific Committee, but we note that the Forest Service was reluctant to embrace the committee's recommendations prior to Judge Dwyer's ruling.

Reply - It is relevant to note that the Department of Agriculture announced on September 29, 1990 that the National Forests would be managed "Not inconsistent" with the ISC Strategy. The Forest Service did embrace the strategy prior to Judge Dwyer's ruling.

[*C4] While we have had some success dealing cooperatively with the Forest Service in our Adopt-a-Forest program it is clear that the agency does its best listening, and its best work, when being addressed by the bench or by our counsel. Accordingly, please accept the comments being submitted by the Sierra Club Legal Defense Fund on behalf of the National Audubon Society.

Reply - This comment does not lend itself to a specific response.

[*C5] While our counsel is providing substantive comments with respect to the legal standards which the DEIS must meet, we would like to comment briefly on another aspect of the document.

Reply - This comment does not lend itself to a specific response.

[*C6] The Forest Service continues to mislead the public on the amount of old growth remaining. In both the summary and discussion in chapters 3-4, the document discusses gross acres without any reference to context. Old growth patches are not homogeneous. They are not like pennies--to be added, subtracted and divided. Your gross analysis is only appropriate when discussing wood fiber. The National Forest Management Act, the American public, and the courts are insisting that the Forest Service consider the ecological values, not merely the timber volume, on the remaining ancient forests. We urge you to begin by ending your unqualified acreage assessment of old growth and adopting a discussion of acreage, stand size, and content.

Reply - A complete analysis of the management of old-growth is beyond the scope of this EIS. Each alternative except Alternative A effectively increases the amount of old-growth forests retained over the long term, and increases the amount of forest that will grow into old growth, undisturbed by timber harvest. Further, the ecological value of old-growth IS discussed both in the old-growth section and in the following one, Wildlife Associated with Late-Successional Forests. This discussion is sufficient for the decision-maker to reasonably assess the alternatives and make a reasoned choice.

[*C7] The National Audubon Society looks forward to working with the Forest Service to protect the biological diversity and productivity of our national forests and to provide needed commodities to the American public. We are pleased that our Adopt-a-Forest program has been able to enter into cooperative relationships with many forests and we appreciate the opportunity to develop mutually acceptable data. We are disappointed and frustrated, however, as we return to the courts time after time to force agency compliance with wildlife protection laws. The only satisfaction is that we continue to prevail, and, hopefully, continue to preserve the opportunity to protect national forest wildlife habitat.

Reply - This comment does not lend itself to a specific response.

RESPONSES TO COMMENTS FROM OREGON NATURAL RESOURCES COUNCIL

The following represents comments received from Oregon Natural Resources Council, in November 13 1991 letter to Jerald N. Hutchins, in response to the Draft Environmental Impact Statement for the Northern Spotted Owl. Each of ONRC's numbered comments is followed by a response.

Please accept the following comments on the 1991 Draft EIS on Management for the Northern Spotted Owl in the National Forests:

1. The statement of purpose and need stated on page 1-1 is too narrow and has consequently unduly limited the scope of the alternatives considered. We concede that one of your purposes must be to comply with the Dwyer injunction and the Regulations at 36 CFR 219.19 which require the Forest Service to maintain "viable populations" of spotted owls. Another broader purpose must be to "provide for diversity of plant and animal communities" as required by the National Forest Management Act. The "viable populations" requirement from the Code of Federal Regulations may derive from NFMA, but the purpose of the action proposed here should not focus exclusively on the viable population requirements and thereby lose sight of the "diversity of plant and animal communities" requirement of NFMA. It is the latter mandate, to provide diversity of plant and animal communities, which is ultimately driving those process.

Reply - The introduction to comments on the management of other resources on page L-A-3 in the FEIS states: "This environmental impact statement is narrowly focused on a management plan to ensure the viability of the northern spotted owl. Many reviewers who commented on the DEIS wanted the scope of this document broadened to consider the management of other forest resources. The FEIS continues with the same scope, proposed action, and purpose and need that were in the DEIS.

"This does not close the door on future consideration of the management for issues for old-growth, old-growth associated species, water quality, or fish stock viability. The land and resource management planning process set up by NFMA assures that such issues will be reconsidered at specified, periodic intervals, as well as when conditions indicate they should be examined or reexamined."

The response to the third comment on page L-A-4 of the FEIS states: "In the Court's opinion of May 23, 1991, (SAS v Evans, slip op. Findings of Fact 20. and 21., the Court, in establishing the schedule for this environmental impact statement, observed:

"20. The Forest Service now has advantages it lacked in early 1990. Much of the research and analysis has been done. The ISC Report, a thorough treatment, has been in existence for more than a year. The agency also

has the benefit of an opinion letter from the FWS dated April 10, 1991, commenting at length on the ISC strategy and giving recommendations.

- "21. With the knowledge at hand, there is no reason for the Forest Service to fail to develop quickly a plan to ensure the viability of the spotted owl in the national forests. Coordination with the FWS need not be an obstacle; the agencies have coordinated their efforts on other species, and can on this one.

"The Forest Service sees no instruction in Court's orders to prepare a plan for the management of old-growth forests. It sees its definition of the Proposed Action and the Purpose and Need statements in Chapter 1 as being fully responsive to the Court's instructions of May 23, 1991:

"A. The Forest Service is enjoined to proceed diligently in compliance with NFMA, as required by the order on April 1, 1991 (Dkt. #867), and to submit to the court and have in effect by March 5, 1992, revised standards and guidelines to ensure the northern spotted owl's viability, together with an environmental impact statement, as required by NFMA and its implementing regulations."

1. (continued) If maintaining diversity of plant and animal communities were one of the purposes of this proposed action, then at least one of the alternatives considered should focus on old-growth forest communities. In the face of declining diversity in the old-growth forest ecosystem new Standards and Guidelines must be developed to provide diversity of plant and animal communities, not just the spotted owl.

Reply - The response to the fourth comment on page L-A-9 of the FEIS states in part: "The Forest Plans as developed in Region-6 and being developed in Region-5 adequately consider and provide for this diversity of plant and animal communities. Since the Forest Plans remain in effect, with additional protection for spotted owl habitat, the diversity of communities is assured.

2. The preferred alternative B, although based on the Interagency Scientific Committee (ISC) report, cannot include many components of the ISC Strategy which are outside the scope of authority of the Forest Service. "A change in application of the overall strategy on any landownership changes the risk for the plan to succeed in maintaining a viable, well-distributed population of owls" See "Responses to Questions Pertaining to Interpretation and Implementation of the Interagency Scientific Committee Conservation Strategy," RO, January 2, 1991 which was incorporated by reference into the DEIS. "Less than full implementation of the strategy, as proposed, such as reducing the size of numbers of HCAs, increasing the spacing between HCAs, or any change in strategy in portions of the owl's range, will substantially change the viability assessment and greatly reduce the likelihood of long-term northern spotted owl persistence." See ISC-387, Appendix T: Risk Assessment (emphasis added). In spite of these statements the DEIS gives alternative B a HIGH viability rating which does not reflect the limited scope of alternative B. Maintenance of viable populations under the ISC depends upon consistent management of lands under the jurisdiction

of the BLM and various state governments. The viability conclusions on DEIS 2-47 and DEIS 3&4-73-74 were based on broader application of the ISC Strategy than is proposed in alternative B. The scope of this DEIS cannot include BLM lands and state lands, so these viability conclusions are wrong.

Reply - The response to the first comment on page L-A-1 of the FEIS states: "The Forest Service has no jurisdiction to direct the management of lands other than those, such as National Forests, National Grasslands, and some National Monuments, that are specifically assigned to the Agency by Law or Executive Order."

The response to the second comment on page L-A-1 of the FEIS states: "How other land managers manage spotted owl habitat is important but not within the Forest Service's jurisdiction. In assessing viability it is assumed that other Federal land managers will comply with Section 7(a), and private and other landowners will comply with Section 10, of the Endangered Species Act.

"The northern spotted owl is listed as a Threatened subspecies; the effect of the management direction presented in these alternatives on the viability of the entire subspecies is of concern to the public and the Forest Service. Therefore, the viability analysis in this FEIS assesses the effect of the alternatives (which provide management direction for National Forests lands only) on the long-term viability of the northern spotted owl as a subspecies in the planning area.

"This viability analysis of the subspecies is appropriate because 1) the viability of populations outside the National Forests contribute significantly to a well distributed viable population in the National Forests, 2) the CEQ regulations implementing NEPA Section 102 (40 CFR 1508.25(a)(2), 1508.25(c) and 1508.7) require the analysis and disclosure of consequences outside the immediate site or planning area, and 3) the Endangered Species Act (Section 7(c)(1)) requires a biological assessment to identify the effects of an action on a Threatened, Endangered, or Proposed Species. (The biological assessment may be undertaken, as it was in this case, as part of the environmental impact statement.)

"The U.S. Fish and Wildlife Service, under the authority of Section 7(a) of the Endangered Species Act, is responsible for evaluating whether or not a threatened species is jeopardized by another Federal agency and that its critical habitat is not destroyed or adversely modified. That responsibility is the basis for assessing the effect of the alternatives in this FEIS on the viability of the northern spotted owl.

"This environmental impact statement uses the assumption that other lands will be managed in accordance with Section 7(a) or Section 10 of the Endangered Species Act. Specifically, it is assumed that as a result of consultation with the U.S. Fish and Wildlife Service other Federal agencies will manage their lands with a level and pattern of owl habitat protection necessary to meet the requirements of the Endangered Species Act and comparable to that presented in the ISC Strategy. This assumption is based on the record of consultation and opinions issued by the U.S. Fish and Wildlife Service in the last two years and on compliance by other agencies.

"The other Federal land management agencies have managed their lands in accordance with the opinions of the U.S. Fish and Wildlife Service and in accordance with the Endangered Species Act. It is true that the Bureau of Land Management in Oregon, after receiving "jeopardy opinions" on 44 proposed timber sales, applied for an exemption from the requirements of the Endangered Species Act under the Act's provisions of Section 7(g). The Endangered Species Committee has yet to rule on this application. A decision is expected in the first half of 1992. The Bureau of Land Management has not made any irreversible or irretrievable commitments of resources which would foreclose management of the habitat in accordance with the U.S. Fish and Wildlife Service's recommendations.

"Should the Endangered Species Committee grant an exemption to the Bureau of Land Management and the spotted owl habitat on the lands it manages is adversely modified, this new information would be a cause for reexamining the effects on the viability of the spotted owl as a subspecies and reexamining the management direction for its habitat on the National Forests.

"Where the management of owl habitat by other managers is especially crucial to the viability of the northern spotted owl, it is identified in the environmental impact statement, along with the consequences should those management assumptions not be met."

The response to the second comment on page L-A-35 of the FEIS states: "The analysis of viability used only those lands in the National Forests within the range of the northern spotted owl. Some assumptions about other Federal and nonfederal lands regarding compliance with the Endangered Species Act were made, but only National Forests were used in the calculations of viability in this EIS. The panel [assessing viability] was fully aware of this assumption."

Also see the discussion on 3&4-51 of the FEIS, "Assessing the Alternatives.

2a. Table T5 at ISC-385 gives a radically different picture of population viability than is portrayed in the DEIS. The table sets out qualitative viability assessments, based on the Delphi Method, for spotted owl populations by physiographic province and Area of Special Concern after the ISC Strategy has been implemented for 50 years. Only six regions out of 16 total regions are given viability ratings of High or Very High. Five regions are rated Moderate, and five regions are predicted to have Low or Very Low chances of maintaining viable populations. Despite the fact that two-thirds of the regions are rated Moderate, Low, or Very Low under the ISC Strategy, the DEIS says the overall viability rating for alternative B is High, even though the DEIS proposal is far more limited than the ISC report which is rated predominantly Very-Low, Low or Moderate. There is something seriously wrong with the viability analysis in the DEIS that must be corrected in the FEIS. If the Forest Service is shooting for high likelihood of viability, a much more protective approach must be taken than is proposed in alternative B.

Reply - The ISC table T5 at page 385 of the ISC Report, indicates that there are specific portions of the range where there is a MODERATE likelihood of sustaining a viable population at year 50. However, the viability rating for

the Olympic Peninsula, Oregon Cascades and Klamath Provinces were rated as either HIGH or VERY HIGH, with the knowledge that there are specific areas of concern within the provinces. The Oregon Coast Range was rated as a MODERATE. The provincial rating for the Washington Cascades was not provided.

The ISC Report recognized the potential problems in the specific areas when the overall ratings were developed. The ISC Report states in reference to table T-5 (page 384):

"In the Areas of Concern, the probability to long-term success may be substantially lower because of their higher risks. Nevertheless, with full implementation of the conservation strategy (table T5), we believe that a high to very high probability of long-term success exists for maintaining population viability for the northern spotted owl through the next 100 years over its current range."

This issue was also addressed in the ISC Report on page 39 where it is stated there is a VERY HIGH likelihood of sustaining a viable population for at least 50 years (Thomas et al. 1990: 39).

Further, the team of experts that formulated and conducted the viability analysis for this environmental impact statement used a revised viability analysis from that used in the ISC Report and rated Alternative B as having a HIGH likelihood of viability. The analysis carried the viability calculations out to 150 years. The interdisciplinary team recognized a decrease in habitat at 50 years for Alternative B. Three factors led to the overall HIGH rating. First, total acres of nesting, roosting, and foraging habitat are expected to increase over current amounts by year 100 so long-term likelihood of persistence is high. Second, the habitat decrease at the 50-year point is temporary and the viability analysis shows an increase in subsequent years. And third, because the Alternative calls for well distributed, large clusters of spotted owls, survival and replacement of owls in reproductive pairs is expected to be high.

Further information on this issue appears in response to the first comment on L-A-35 of the FEIS, which states: "The ISC Strategy was given an overall viability rating of HIGH in both the ISC Report and this EIS with recognition that habitat will decrease in the short term. The ISC Strategy was rated as providing a VERY HIGH probability of sustaining spotted owl populations for at least 50 years (Thomas et al. 1990: 39). The ISC Strategy provides for a pattern and distribution of habitat to minimize risk to the spotted owl.

"The standards and guidelines of the ISC Strategy, such as those for designated areas and dispersal habitat, are designed to provide for a viable population of northern spotted owls. An example of how the ISC Strategy accounts for particular areas is that in areas of concern, Category 1 or 2 HCAs are delineated, and in some areas, Category 3 HCAs are required. The EIS viability analysis for this environmental impact statement recognized that there is an expected loss of habitat at year 50, but after review of the entire Strategy, Alternative B was given an overall viability rating of HIGH."

- 2b. The discussion on DEIS pages 3&4-73-74 of the Alternative B Viability Rating is vague and void of meaningful reference points.

Alternative B would provide owl numbers at "higher levels" than alternative A. Alternative B. would result in a "lower rate" of habitat loss than alternative A. Comparing alternative B to alternative A is not helpful, because alternative B is being compared to failure. (Alternative A has a LOW viability rating.)

Other vague references include "relatively large clusters...substantially greater likelihoods of persistence and occupancy...designation of substantial area of young forest...enhance connectivity...provide for additional sources of reproductive pairs...suitable habitat in substantially larger and more contiguous blocks...enhancing interaction of owls...substantially enhances the occupancy rates...clusters of pairs are to be provided in large sizes generally adequate to withstand some catastrophic losses..." (emphasis added) See DEIS 3&4-74.

Reply - First, each alternative was analyzed using seven viability criteria. Then each alternative was given a viability rating in order to give the decision maker an evaluation of the relative merit of those alternatives. Finally, the comparison was done.

The response to the fourth comment on page L-A-8 of the FEIS states: "The language in the FEIS is that felt to be most accurate by the specialists and writers on the interdisciplinary team. The analysis of environmental effects is the prediction of what will happen in the future. Information on forest resources and relationships continues to accrue. The terms used in the environmental impact statement to indicate the degree of certainty or uncertainty are used by specialists who know the information well. The portrayal of the estimated degree of uncertainty will aid the decision maker in making a reasoned choice among the alternatives."

2c. The viability discussion on DEIS 2-47 mentions increased conservation of habitat in Areas of Concern, yet the description of alternative B fails to describe in detail these efforts at increased conservation. My copy of the DEIS is marked with big question marks wherever Areas of concern are mention, because specific conservation proposals for Areas of Concern are never stated. The FEIS must be very specific in describing management requirements for all Areas of Concern, including the Coast Range and the Olympic Peninsula.

Reply: The viability analysis was refined between the DEIS and the FEIS. Additional information on Areas of Concern is presented in the FEIS, pages 3&4-66 through 72.

2d. DEIS 3&4-3 says that no new simulation studies were done to assess viability. This is fatal to the viability conclusions drawn by the drafters of the DEIS or any other expert. The scope of alternative B is fundamentally narrower than the comprehensive strategy of the ISC Report. The viability rating of alternative B must be substantially different than the viability rating of the ISC Report implemented as originally drafted.

Reply - The viability analysis in the EIS is independent of the ISC Report. The viability analysis in the EIS is based on 7 criteria that were used to assess the viability of the owl.

- 2e. The fact that Alternatives B, C, and D all receive HIGH viability ratings indicates that the rating system was not sensitive enough to fully inform the public or the decision-maker about the differences in risk associated with the various alternatives. The viability system must be radically revised to be more sensitive and give more detailed information to the decision-maker and the public. The HIGH rating "denotes a high likelihood of viability." The next rating below high is MEDIUM which "denotes an uncertain likelihood (perhaps 50/50 chance) of viability." The gap between "high likelihood" and "perhaps 50/50 chance" is too great to be of any use to a decision-maker trying to make a reasoned choice between alternatives, especially when three of the four choices are rated HIGH. We need more finely tuned tools here.

Reply - We agree that a more refined population viability analysis would be desirable, however we are using the state of the art tools and concepts. This rating system was developed and reviewed by experts in the field.

- 2f. In Questions and Answers on A Conservation Strategy for the Northern Spotted Owl" (USFS, PNW Research Station, Feb 1991), the answers to questions numbered 16 and 29 indicate that implementation of the strategy will provide for 1,772 owl pairs. This means that over half of the currently estimated number of owl pairs will perish before the owl population is expected to stabilize. Since the existing owl population is "threatened" according to the US Fish & Wildlife Service, the public needs to be assured that a 50% reduction in a threatened population will leave us with a reasonable chance of maintaining a viable population of owls.

Reply - The response to the last comment on page L-A-34 states: "The absolute value which assures viability or precipitates extinction is unknown. It is not simply an absolute number of owls that could assure viability, the amount and pattern of habitat are primary factors in providing for a viable population."

"Research and monitoring of northern spotted owl populations will provide opportunities to evaluate management, and alter the current direction if needed. Management direction is conservative enough to allow detection of any adverse effects to spotted owls in sufficient time to use the adjustment process to preserve long-term viability."

Additionally, The response to the first comment on page L-A-35 of the FEIS states: "The ISC Strategy was given an overall viability rating of HIGH in both the ISC Report and this EIS with recognition that habitat will decrease in the short term. The ISC Strategy was rated as providing a VERY HIGH probability of sustaining spotted owl populations for at least 50 years (Thomas et al. 1990: 39). The ISC Strategy provides for a pattern and distribution of habitat to minimize risk to the spotted owl."

"The standards and guidelines of the ISC Strategy, such as those for designated areas and dispersal habitat, are designed to provide for a viable population of

northern spotted owls. An example of how the ISC Strategy accounts for particular areas is that in areas of concern, Category 1 or 2 HCAs are delineated, and in some areas, Category 3 HCAs are required. The EIS viability analysis for this environmental impact statement recognized that there is an expected loss of habitat at year 50, but after review of the entire Strategy, Alternative B was given an overall viability rating of HIGH."

Further, the habitat capability analysis that was done in the FEIS, indicates that habitat capability is expected to be 74% of the current capability estimates rather than the scenario of a 50% decline.

3. Under the ISC strategy, BLM districts north of highway 38 and west of I-5 should establish category 3 HCAs. Since this will not be possible under this Forest Service decision, and because the HCAs recommended by the ISC on state lands in northwest Oregon and southwest Washington are not being implemented under this proposed action, alternative B should be amended to provide for significant additional protection for spotted owls in the Siuslaw National Forest and the Olympic National Forest. Maybe the HCAs recommended in those forests north of highway 38 and west of I-5 should be substantially enlarged and/or more existing suitable habitat protected.

Reply - See the reply to the first #2 above.

4. The draft EIS fails to list the target number of owls for each category one and category two HCA.

Reply - These numbers are listed in the ISC Report, pages 328 - 340, and the Report is incorporated by reference in the EIS.

5. Flaws in the proposed system of category 4 HCAs enhances the likely failure of Alternative B to provide viable populations of the owls. Consider amending the rules regarding category 4 HCAs, at page 2-29 of the DEIS, so that if there is not at least 80 acres of suitable owl habitat within 1/4 mile of the center of activity, then the suitable habitat designated to accommodate the next nearest category 4 HCA should be enlarged proportionately to compensate for the increased risk borne by the owl pair occupying the habitat deficient HCA. The FEIS should clarify the rules for establishing category 4 HCAs. The 80 acres reserved are exclusive of other HCAs within 1/4 mile of the nest.

Reply - "Flaws in the proposed system of category 4 HCAs..." is unsubstantiated. The viability assessment was conducted based on the ISC strategy given the standards and guidelines without modification. If new information indicates that there is a need to modify the standards and guidelines for category 4 HCAs, then this would be possible through the adaptive management process that is part of the ISC strategy.

6. The site specific management plans for category 1, 2, or 3 HCAs, mentioned on page 2-30 of the DEIS, must be accompanied by further site specific NEPA documentation. Also, any adaptive management proposal (ISC, Appendix R), timber harvest or other habitat

modification must be preceded by approval of the site specific management plans prepared in accordance with NEPA.

Reply: The FEIS notes the role of the NEPA process in implementation in the second paragraph on page 2-35 which states: "The implementation process that will be used to insure consistency of habitat management in accordance with the areas and the standards and guidelines prescribed in these alternatives will be the process used by the Forest Service to meet the requirements of the National Environmental Policy Act (NEPA). A proposed action is subject to the NEPA process. These Forest Service decisions are commonly subject to the Forest Service Administrative Review (Appeal) regulations 36 CFR 217. There will also be, as appropriate, consultation with the U.S. Fish and Wildlife Service under the procedures of the Endangered Species Act, Section 7(a)."

7. Incorporation by reference of the ISC Report should include thorough editing and updating, so that references to management requirements for FY 90 do not constrain implementation of the strategy in 1992.
- 7a. Incorporation of the ISC report without modification means that the ISC report must meet the standards for readability and understandability just like any other NEPA document. The public has a statutory right under NEPA to be fully informed of the environmental impacts of the proposed action. Some parts of the ISC Report are too technical to be readily understood by the general public. For instance, the ISC Report on page 352 refers to "type 2 errors (failure to reject false null hypotheses)." Technical language like this must be rendered palatable to the general public.

Reply to 7 and 7a above - In response to the comment that the Forest Service should edit and update the ISC Report for readability and clarity since it is being incorporated by reference, and render technical language palatable to the general public, the response to the first comment on page L-A-9 states: "The ISC Report is a technical report, and technical language is necessary for precise communication. The report is generally very accessible to readers, and the accompanying Questions and Answers clarify and expand on specific points.

"New information on the spotted owl is included in this document; updating the ISC Report with the same information would be an inefficient use of time and resources for minimal benefits.

"The Council on Environmental Quality notes in their "Forty Most Asked Questions Concerning CEQ's NEPA Regulations" that material incorporated by reference would include 'Research papers in the general literature, technical background papers or other material that someone with technical training could use to evaluate the analysis or the proposal'."

- 7a. [sic] References to FY90 under "Inventorying and Monitoring" on DEIS 2-30 must be amended to refer to all future sales. Sufficient owl survey visits (six total, three in one year) should precede all future timber sales, not just 1990 sales and sales currently under contract.

Reply - This management direction refers to timber sales within HCAs which were under contract before the HCAs were established, or in fiscal year 1990. Since

no sales were placed under contract in subsequent years, and are prohibited in the future, the wording is accurate and adequate as presented. When the Forest Service began implementing the ISC Strategy on September 29, 1990, no further timber sales were proposed or sold in HCAs.

- 7b. On DEIS 2-30, under "Timber Management," delete the first two exceptions to the prohibition against timber harvest. These references to sales under contract should no longer apply.

Reply - This is addressed in the response to the third comment on page L-A-48 of the FEIS which states: "The alternatives balance the need to ensure viability of northern spotted owls with the social and economic impacts of harvesting timber sales which are under contract. The viability analysis in the EIS reflects the effects of this harvesting." The ISC recognized this need when they developed this standard and guideline.

8. DEIS 2-30, The prohibition on timber harvest of any age-class forest should be amended to specifically prohibit salvage of down or standing trees also.

Reply - The response to the second comment under the category of Forest Health on page L-A-49 of the FEIS states in part: "...recurring salvage logging is not allowed under the ISC Strategy. Any proposals for salvage logging due to special circumstances must be evaluated on a case-by-case basis by the Oversight Team and Steering Committee to determine if the action is consistent with the ISC Strategy." Salvage is addressed in the standard and guideline on page 2-31 of the DEIS, and the ISC Strategy states: "Therefore, logging (including salvage operations) and other silvicultural activities (with exception of stand regeneration) should cease within HCAs." At this time, salvage direction is best summarized in the ISC questions and answer set #3 dated April 30, 1991, from the Interagency Northern Spotted Owl Conservation Group's (ISOG) Technical Review Team. This is the team that was referred to in the ISC Report standards and guidelines that addressed salvage. The following quote is from the fourth question on page 3 of the question and answer document, and appeared in the DEIS on page 2-31: "...The review team has discussed the definition of "extensive" and were not able to satisfactorily define it at this time. The Team recommends that a group be established to investigate this issue and provide a recommendation(s) back to the Team.... Until such time that a definition is formulated, no salvage activities should occur within HCAs."

9. DEIS 2-31, consider amending the first sentence to read, "Allow silvicultural treatments that have been conclusively demonstrated through repeated experimentation to facilitate development of suitable habitat, such as planting trees..."

Reply - We believe the spirit of this suggestion is met by the processes described both in the ISC Report and in the FEIS. The response to the last comment on page L-A-46 of the FEIS states: "Appendices S and R of the ISC Report explain the process for identifying silvicultural treatments that will be appropriate in HCAs. Only those treatments shown to benefit spotted owl habitat will be used. The ISC Report recognizes that research and experimentation are needed to identify structural habitat needs and to assure that these characteristics can be created silviculturally, before any

treatments are undertaken." The response to the last comment on page L-A-47 of the FEIS states: "Under the ISC Strategy.....there are provisions for research and experimentation relative to the use of silviculture to maintain or improve owl habitat. If this research demonstrates silvicultural treatments are beneficial to owl habitat, there is a process by which they can be applied to designated areas managed primarily for owl habitat. Research is needed to define the essential components of habitat. Spotted owl nesting, roosting, and foraging owl habitat is very complex; the key flying squirrel prey-base feeds on a fungus dependent on the litter layer; suppressed or understory trees seem to be primary perching places; the mix of size classes, openings, and debris such as down logs and limbs function in complex ways to provide for food for the owl and the owl prey species while at the same time not favoring other species that would successfully compete with the spotted owl for these components of the habitat. Silvicultural treatments clearly providing more benefit than risk may be approved early. Examples may be precommercial and early commercial thinning, or treatments of fuelbreaks and stands prone to catastrophic insect and/or disease outbreaks. But until spotted owl habitat is more fully understood, protection of stands in a manner known to favor owls, e.g., no treatment, is what the ISC Strategy recommends."

10. DEIS 2-32, "Reserved Lands-- No decrease in the present direction of management for all forested lands in this category." This sentence means almost nothing to the casual reader. If you mean no timber harvest allowed, say "no timber harvest allowed on reserved lands such as wilderness areas." The same complaint applies to the statement on Lands Unsuitable for Timber Production. Say what you mean in plain English.

Reply - The response to the fourth comment on page L-A-43 of the FEIS addresses this comment: "The reference to "Reserved Lands" and "Lands Unsuitable for Timber Production" is a direct quote from the Interagency Scientific Committee's Report. The Glossary in this environmental impact statement contains definitions for each of these terms and they are discussed in Chapter 3&4. The maps prepared for the FEIS include, for clarification, the acreage of owl habitat within unavailable lands on National Forests."

10. (continued) What about the boundaries of wilderness areas and HCAs? There have been many instances of encroachment on wilderness areas. Many acres of wilderness have been harvested because of boundary mistakes. One of the FEIS alternatives should consider comprehensive boundary surveys and boundary marking for HCAs and wilderness areas within the range of the Northern Spotted owl.

Reply - Surveys and boundary marking are conducted at the project level wherever such conflicts are likely to occur.

11. DEIS 2-32, under Lands Suited for Timber Production, "retain existing considerations for other resource values..." The reader is left to guess, "other than what?" Rewrite this statement to be clear and direct.

Reply - We chose not to 'rewrite' this statement because it was quoted from the ISC Report. The statement is interpreted to mean: continue to apply existing LMP Standards and Guidelines to suitable timber land, such as those for

"...wildlife trees and downed wood retention". This point is made in the FEIS on page 2-3 which states in part: "The other four Alternatives (B, C, D, and E) retain all of the mitigation measures and standards and guidelines of the existing land and resource management direction except for that directly superseded by the designated areas and standards and guidelines for these alternatives. Direction to manage and protect the environment and resources of the National Forests is in place; these alternatives add to that direction."

12. DEIS 2-32, "Establish 80-acre retention areas (Category 4 HCAs)." This management requirement must be amended to be consistent with the standards and guidelines on DEIS 2-29. Eighty acres is a minimum size limit for category 4 HCAs, not a hard and fast rule of a maximum size limit.

Reply - The above quote from page DEIS 2-32 is incomplete. The complete quote refers the reader back to the standards and guidelines of page DEIS 2-29, thus there is no inconsistency.

13. DEIS 2-33, where the quarter township contains multiple ownerships, the 50-11-40 acreage is computed separately for each ownership. The Forest Service should consider amending this requirement so that the Forest Service accepts more of the burden than mere proportionality would require. National Forest land, being in federal ownership and held in trust for all the present and future citizens of the United States, should be managed with emphasis on long-term values such as species protection. In this way the benefits and burdens can be more easily shared by the general public.

Reply - The response to the first comment on page L-A-41 in the FEIS states: "Some (perhaps many) private lands, depending on the rotation age selected for such lands, would meet the criteria at a given time. The ISC Report called for reevaluation after 3 years. If dispersal is less than satisfactory, the standard may be revised."

14. DEIS 2-33, ISC Adaptive Management recommendations. Standards and guidelines finally approved by the NEPA process currently under consideration must not be subject to ad hoc amendment through site specific EAs for particular timber sales. Adjustment of these standards and guidelines should only be allowed through the normal process of forest plan amendment and must be accompanied by full NEPA documentation. Standards and guidelines should be binding rules, not mushy adjustable rules of thumb.

Reply - This comment was acknowledged and responded to in the response to the third comment on page L-A-20 of the FEIS which states: "The process of implementing the decision is presented by alternative in Chapter 2 of this document. This EIS describes a process that is an expansion of the process established in the ISC Report, and uses an Oversight Team and a Steering Committee. The implementation and adaptation process will be subject to NEPA, with documentation appropriate to the action."

See also the second paragraph on page 2-35 of the FEIS, as quoted in the reply to #6 above.

- 14a. The ISC Report Appendix R which was incorporated by reference into the DEIS identifies adaptive management as an inappropriate management tool within HCAs. The adaptive management technique should be used only in the forest matrix until the responses of owls to habitat manipulation are more fully understood. ISC-352 emphasizes that research information should be gathered from harvest influences on spotted owl pairs in the forest matrix, not within HCAs. Experiments in the forest matrix should include increased retention of large trees, snags, and dead-and down woody debris, extended harvest rotations, reduced fragmentation, etc...

Reply - See reply to comment #9 above. Various responses on pages L-A-46 through L-A-48 and elsewhere in Appendix L note the need to identify structural components important to owl habitat, and how to create them. For example, the response to the first comment on page L-A-47 states in part: "Stand management techniques such as extended rotation and commercial thinnings will undoubtedly be explored through research and experimentation under ISC Strategy recommendations. Many of the currently available silvicultural practices that leave various structural components within the stand should contribute to spotted owl habitat earlier than even-aged plantations. However, the complete set of structural components necessary for spotted owl nesting, roosting, and foraging habitat is not yet fully understood."

- 14b. Although we agree in principle with the underlying theory of adaptive management, the spotted owl management problem does not lend itself to the adaptive management technique, because "the spotted owl population response to implementing the conservation strategy will be manifest only over broad scales of space and time." (ISC-347). In other words, the spotted owls' responses to silvicultural experiments will be difficult to discern because of the delayed response of spotted owl populations to changes in the landscape patterns.

Reply - We concur that the spotted owl's response to silvicultural experiments may be difficult to discern. However as stated in part to the response to the 2nd comment on page L-A-41: "...Silvicultural treatments or other habitat manipulations must demonstrate beneficial effects before they will be implemented in HCAs." Further there will be review of any proposals by an Oversight Team and an interagency Technical Review Team, see pages 2-33 through 2-37 of the FEIS.

- 14c. The monitoring program mentioned in ISC-349, which is essential to Adaptive Management, sounds very impressive, but expensive. Where will the money come from? K-V? (doubt it). New appropriations should be requested.

This issue is addressed in the response to the fifth comment on page L-A-44 of the FEIS which states: "Funding for monitoring will be requested through the normal annual budgeting process. It is normally inappropriate to use KV funds for monitoring."

- 14d. Adaptive Management is a hollow facade without explicit objective criteria to evaluate the results of management experiments. What will the early warning signals be that trigger increased protection

or relaxation of management constraints? The EIS is incomplete without disclosing these threshold criteria.

Reply - Researchers have not been able to define specific trigger points. However the spotted owl population and habitat status and trends can be monitored. If the research findings and monitoring results indicate that the population or habitat are not functioning as assumed in the strategy, then corrective measures can be taken.

- 14d. (continued) In "Questions and Answers on A Conservation Strategy for the Northern Spotted Owl" (USFS, PNW Research Station, Feb 1991), the answer to question number 40 states that research outside HCAs must "clearly" show how harvest can be conducted without negatively impacting spotted owls, before harvest will be allowed inside HCAs. The answer to question number 93 says that silvicultural experimenting cannot take place until silvicultural methods have been "proved" to conserve spotted owls. To prevent accidental destruction of spotted owl habitat within HCAs, the FEIS must disclose the thresholds of certainty that must be attained before silvicultural experiments are allowed in HCAs. See DEIS 2-31. Consider amending the first sentence to read, "Allow silvicultural treatments that have been conclusively demonstrated through repeated experimentation to facilitate development of suitable habitat, such as planting trees..."

Reply - The specific wording changes that are recommended do not change the direction provided in the standards and guidelines as they are written. For further information on this issue, see the reply to comment 9 above which provides the responses to the last comment on L-A-46 and the last comment on L-A-47. In summary, the adaptive management approach will be used if appropriate. The adaptive management process is described in the FEIS beginning on page 2-33.

15. Reading the DEIS it is not clear exactly what the standards and guidelines will be. Alternative B is the ISC report applied to USFS lands, but the ISC Report is not exactly drafted like the standards and guidelines we are familiar with in the current forest plans. Maybe the FEIS should explicitly set-out the standards and guidelines for the preferred alternatives as they would appear in a forest plan document.

Reply - Appendix Q of the ISC Report contains the standards and guidelines and the standards and guidelines have been reprinted in the EIS, Chapter 2. The format for these are similar to the standards and guidelines generally presented in Forest Plans.

16. DEIS 2-35, "Standards and guidelines and management direction in Forest Plans not directly superceded by the selected alternative will remain in effect." This statement is fine but should be clarified by adding another sentence, "Any conflict arising between the selected alternative and existing Forest Plan standards and guidelines not directly superceded shall be resolved in favor of non-intervention in natural processes."

Reply - This issue is addressed in the response to the last comment on page L-A-20 of the FEIS which states: "The section 'Implementation' for each of the alternatives (see Chapter 2) indicates that the Forest Plan amendment and NEPA processes will be used to resolve any such conflicts." See also the reply to comment #6 above.

17. The map of alternative D fails to identify actual nesting, roosting, and foraging habitat for the spotted owl. The map is merely overlaid by an abstract pattern to resemble the actual habitat represented. The public and the decision-maker need to know exactly what is being proposed. The GIS System should be called into action, and if the GIS doesn't have such a data layer, then an inventory and location database must be completed to comply with NFMA and NEPA and MUSYA.

Reply - This issue is addressed in the response to the second comment on page L-A-29 which states in part: "The scale used in the maps accompanying this environmental impact statement is not suited to displaying individual stands of nesting, roosting, and foraging habitat for Alternative D. The maps in this EIS show only the general distribution of habitat. However, the analysis and data tables in this EIS are based on more detailed maps."

- 17a. All the alternative maps should have township, range and section lines indicated on them, or, alternatively, legal descriptions of the HCAs should be provided. The ISC Report is not a NEPA document, so the ISC could get away with some ambiguity in their proposed HCA boundaries. (Ambiguity may have even been politically expedient in the ISC.) The Forest Service on the other hand cannot get away with such ambiguity in a NEPA document that is required by law to provide sight [sic] specific information to the public and the decision-maker. If the FEIS leaves the final boundaries up to individual Forests or Ranger Districts, then we feel compelled to demand that further NEPA documentation accompany the final boundary determinations.

Reply - This issue is addressed in the response to the first comment on page L-A-21 of the FEIS which states: "The boundaries of the areas, which are illustrated on the FEIS maps, are in the GIS system in detail (see Appendix B) and represent boundaries located in operational detail for all alternatives."

18. DEIS 2-45 says "viability ratings were discussed by a panel of...experts," but were these discussions disclosed to the public and to the decision-maker? Where is this information available?

Reply - The summaries of results of the meetings held with scientists and spotted owl experts are presented in the viability portions of the DEIS and FEIS. Notes from the viability meetings are part of the administrative record, and are available to the decision maker.

19. Incomplete or Unavailable Information-- DEIS 3&4-1, states that "the basic data and the central relationships are well established" regarding the effects of the alternatives. ONRC contends that the role of uncertainty in this analysis is more critical than the Forest Service is admitting. We are dealing with extinction here.

While the central relationship trends may be known, the thresholds controlling viability and extinction are essentially uncertain, and the Forest Service should not tell anyone any different. In the face of uncertainty in the critical thresholds controlling extinction, the Forest Service should err on the side of species protection. A much more protective program is needed to assure that viable owl populations are maintained.

Reply - This comment appears premised on an unstated assumption that the current numbers of northern spotted owls is the cause for the determination of its Threatened status. The Final Rule which listed the northern spotted owl makes it clear that it is the foreseeable rate and pattern of future habitat loss that has led to the northern spotted owl's listing as a Threatened Subspecies. (55 FR 26182) Since all alternatives (except the No-Action Alternative) slow this rate of loss, there are grounds for proceeding with management based on existing knowledge.

19. (continued) Regarding uncertainty, DEIS 3&4-4 states, "Annual variation in percent of spotted owls paired, percent of owls that produce young, egg mortality in the nest, nestling mortality, fledgling mortality, and the determining mechanisms of each of these rates is [sic] not well known. Variation in these rates can influence likelihoods of persistence of the population over time." DEIS 3&4-29 states "little empirical information exists on the effects of prey abundance on reproductive success in northern spotted owls." ISC-351 states, "Uncertainty also exists about the range of forest types used by the owl in many areas." Table R2, ISC-353-354, lists 26 research questions, each of which implies some level of uncertainty. The incomplete and unavailable information is "not essential to a reasoned choice among alternatives." Are any of the identified examples of uncertainty "essential to a reasoned choice among alternatives?"

Reply - See reply to the next paragraph.

19. (continued) Since the uncertainty identified in the previous paragraph may be essential to a reasoned choice among the alternatives, the Forest Service must determine whether the overall costs of obtaining the relevant information are "exorbitant." If the costs of doing the necessary research are not exorbitant, the research must be done and the information included in the EIS. If the costs are exorbitant then the Forest Service must include information required by 40 CFR 1402.22.

Reply - The issue of incomplete and unavailable information is addressed in the response to the comment on page L-A-6 of the FEIS which states: "The existence of scientific uncertainty was disclosed in the section "Incomplete and Unavailable Information" at the beginning of Chapter 3&4. The foreseeable risks are disclosed throughout Chapter 3&4. The foreseeable risks to the viability of the spotted owl were presented in the viability analysis. The foreseeable risks to other aspects of the environment and the uncertainty surrounding estimates of consequences were addressed in narratives disclosing the environmental consequences (see, for example, the discussions and appendices on Fire and Fuels Management, and Insects and Diseases). Elsewhere,

the uncertainty of estimates are clear in the language that describes the effects in conditional or approximate language rather than in absolute terms.

"As indicated in the section "Incomplete and Unavailable Information" the interdisciplinary team examined the incomplete and unavailable information. The team determined, in the language of 40 CFR 1502.22(a), 'If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among the alternatives.'

"The team concluded that the missing information was very unlikely to reverse or nullify established relationships, and therefore, not essential to a reasoned choice among the alternatives. (Therefore, the requirements of 40 CFR 1502.22(b) were not applicable, though the elements of that section are present in the environmental impact statement.)

"It is important to review the alternatives in light of the factors they incorporate which minimize the risk to spotted owl habitat and subsequently, the spotted owl.

"Each alternative moves at a slow pace. For example, with Alternative B, nesting, roosting, and foraging habitat would be reduced under the Forest Plan standards and guidelines by 0.15 percent annually in the first 50 years. The viability outlook at the 50-year mark is one of a very high probability of viability (Thomas et al. 1990: 39). Habitat conditions are projected to improve (Chapter 3&4, "Criterion 1, Potential Change, Alternative B").

"Each alternative incorporates a monitoring plan and an adjustment process to change management direction should new information indicate that habitat, or the spotted owl, is jeopardized.

"Management activities in Critical Habitat are the subject of consultation with the U.S. Fish and Wildlife Service in all alternatives.

"The alternative selected would be reexamined with the release of the Recovery Plan, and the viability analysis would be reconsidered if the assumptions about management on other Federal lands were changed by the action of the Endangered Species Committee.

"Thus, information which is yet to be developed or more fully specified about spotted owls and spotted owl habitat is not essential to a choice now among the alternatives. The implications of the alternatives and their differences are clear in this environmental impact statement; additional unavailable information is not essential to a choice among them."

20. DEIS 3&4-8, the key for the Olympic Peninsula Province is wrong.

Reply - This has been corrected. See Chapter 3&4-8 in the FEIS.

21. More emphasis should be devoted to the habitat needs of prey species and the management of the forest matrix to provide for foraging opportunities and cover for dispersing owls. ONRC contends that salvage sales should be prohibited even in the forest matrix so that the complex forest structures that result from naturally

regenerating disturbed sites can provide habitat for prey species and foraging opportunities for dispersing owls.

Reply - Dispersal habitat is provided for under Alternative B by the 50-11-40 rule for the Forest Matrix. Salvage harvest must meet the 50-11-40 standard and guideline. The Forest Plan standard and guidelines specify the snag and dead and down requirements.

21. (continued) DEIS 3&4-13 says that "structural components typical of old-growth forests are sometimes found in young forests, especially those that have regenerated after fire or other disturbances that have left behind large trees, snags, and logs from the previous stands." DEIS 3&4-42 says that dispersal habitat needs to "provide stopover places where owls can find suitable cover and, especially, foraging opportunities."

Reply - This is addressed in the introduction to the Alternatives section of Appendix L which states on page L-A-12: "During the comment period many people and organizations offered ideas for new, different, or modified alternatives. They included suggestions for changes in the general management of the National Forests, site-specific changes to boundaries of HCAs and standards and guidelines, sub-regional forest management strategies, the reexamination of Forest Plans for all or specific resource management, and suggestions for major policy or legislative changes. Others requested alternatives that, in the DEIS, were considered but eliminated from detailed study.

"As noted in Chapter 1, this environmental impact statement is sharply focused on providing management direction that will ensure the viability of the northern spotted owl. Many requests would require more time than the injunction established, or greater authority than the Forest Service has. This environmental impact statement responds to the need for management direction on National Forests throughout the range of the northern spotted owl. Requests to consider site-specific modifications or special sub-regional management strategies are too limited in scope for inclusion in this programmatic environmental impact statement.

"Many of the alternatives suggested are ideas that should be explored in other contexts. Some should be raised as Forest Plans are completed, amended, or revised. Others would have to be examined in the research and monitoring of spotted owl populations, habitat, and habitat management. Others can be addressed in the process of making minor adjustments and clarifications as these standards and guidelines are implemented. And some would require the revision of Federal laws."

22. DEIS 3&4-78 states that "clearcutting has been the cutting method of choice for much of the Douglas-fir volume harvested because if [sic] more closely duplicates the natural regeneration methods (fire) in Douglas-fir forests." This is bullshit.

Reply - This issue is addressed in the response to the second comment on page L-A-44 of the FEIS which states: "The text in the FEIS has been changed to address this concern." Specifically, the reference that clearcutting resembles fire has been removed.

22 (continued) For years there were no requirements to leave standing, live, or dead wildlife trees on the site after clearcutting. Nor were there any requirements to retain downed woody material. Nor were there any riparian buffers or shade retention requirements. Plus herbicides were used indiscriminately to truncate the natural sequence of ecological succession. There was far too little effort to duplicate natural processes, and the Forest Service should not lead anyone to believe otherwise.

Reply - In addition to the comment in response to 22 above, the response to the second comment on page L-A-44 of the FEIS states: "It is beyond the scope of this document to assess the effectiveness of past timber harvest practices. Standards and guidelines are incorporated in Forest Land and Resource Management plans to address the resource concerns cited in this comment."

23. The effect of alternative B on implementation of the Knutson-Vandenberg Act must be more fully explained and analyzed. DEIS 3&4-88 mentions a "large workload" impacting limited wildlife habitat improvement funds. What "large workload?"

Reply - This issue is addressed in the response to the fourth comment on page L-A-44 of the FEIS which states: "This section has been clarified in the FEIS and the reference to "large workload" has been removed."

23. (continued) Will habitat improvement projects approved as mitigation of adverse effects under other timber sale EAs be affected?

Reply - Ideally KV collections cover all sale area betterment work shown on the KV collection plan. Exceptions to this occur when the sale price is not adequate to cover all needs, when project costs exceed plans, or when work is needed that was not planned for. These shortfalls can be collected from future sales in the same area. The FEIS indicates that within HCAs, there will not be these future sales. The kinds of work most likely affected include precommercial thinning, release for growth, and animal damage control. Reforestation projects would normally not be affected because they take first priority for collected funds. Mitigation projects would normally not be affected because they too would have a high priority for existing KV funds.

24. The discussion of Pacific yew and Taxol on DEIS 3&4-91 has several errors that must be corrected. First, taxol is present in the needles of the Pacific yew as well as the bark and it may be present in other parts of the tree also. Wherever the word bark is mentioned, the word needles should be added.

Reply - This issue is addressed in the response to the third comment on page L-A-54 of the FEIS which states: "Appendix I in the FEIS notes that taxol is found in the needles and that needles may contribute to the total taxol needs in the future. This reference has been added to the discussion of Pacific yew in Chapter 3&4." Further discussion of this appears in Appendix I on page I-2 which states in part: "Future taxol acquisition may involve individual yew harvesting outside timber harvest units, partial bark harvest from live yew, bough cutting for needles, and other techniques."

24 (continued) Also, since needles may soon provide raw material for taxol extraction, and harvest of needles may be less environmentally damaging than bark harvest, the conflict between yew harvest and spotted owl habitat may be reduced if the parties can make the transition to needles.

Reply - The FEIS describes a relative difference between the alternatives with respect to Pacific yew, and to the degree that alternatives affect road access, the differences will still exist even if harvest focuses on needles. No attempt was made in the FEIS to establish the specific level of difference between the alternatives relative to Pacific yew access because further detail was not necessary for the decision maker to make a reasoned choice from among the alternatives.

24. (continued) There is almost no competition in the high demand for yew resources. There is an enforced monopoly of the resource in favor of Bristol-Myers Squibb operating through Hauser Northwest.

Reply - The use of the term 'competitive' in the EIS was intended to indicate a high demand, and the very active pursuit of taxol sources by other companies. Current efforts regarding the use of needles, for example, are not limited to Bristol-Meyers Squibb.

Although a Cooperative Research and Development Agreement gives B-MS exclusive rights for 7 years after development, this right is limited to ovarian cancer and to taxol from bark. Development of taxol from bark for other cancers, and for taxol from needles and other sources is indeed competitive, and the agreement calls for the Forest Service to make available limited quantities of bark to others for such research and development.

24a. DEIS Appendix I on the Pacific yew (*Taxus brevifolia*) also has some misstatements that should be corrected. The 29 million Pacific yew trees that are alleged to exist include all size classes, whereas the yew trees targeted for harvest are about 10 inches in diameter. Experts estimate that there may be only 1.2 million yew trees in the 10 inch size class, so the present annual rate of harvest is not 1 to 2 percent as cited in Appendix I, but more like 25 percent of the available trees in the harvestable size class.

Reply - This issue is addressed in the response to the first comment on page L-A-55 of the FEIS which states: "The data cited is based on the most current information and the discussion describes what is expected to happen under Alternative A. Alternatives E, B, C, and D propose increasing amounts of designated areas managed primarily for spotted owl habitat. This designation could reduce the amount of Pacific yew harvest. The discussion in the EIS permits a comparison of the alternatives and a reasoned choice among them. Currently, an EIS is being prepared for the management of Pacific yew and additional inventory data is being collected."

In fact, until current inventory efforts are completed, the Forest Service and others have relied on estimates in their "A Paper Provided in Response to the Petition to List Pacific Yew as a Threatened Species", 11/26/90. This document lists the total number of Pacific Yew at 130 million in the Douglas-fir type in the Oregon and Washington Cascades and Oregon Coast Range alone, with 23.3

million of these over 5cm in diameter. The 29 million noted in the DEIS is an expansion of this 23.3 million to include other portions of the range of the yew, such as Idaho, Montana, the Blue Mountains of Oregon, as well as additional forest-types such as the Pacific Silver fir-type. The 5cm cutoff is appropriate because although Yew trees harvested for bark "average" about 10 inches in diameter, they include trees down to 5cm (about 2 inches). This same document notes that there are an estimated 1.2 million Pacific yew trees 10 inches or larger on PRIVATE lands in Oregon, Washington, and California.

Using these numbers, Deputy Chief James Overbay told the Subcommittee on Regulation, Business Opportunity and Energy, committee on Small Business for the House of Representatives, on July 29, 1991, that "If only 10 percent were actually available for harvest.....it would take about 60 years to deplete the supply, not counting for regeneration." We do not see any of the citations you reference as "misstatements".

- 24a. (continued) The Appendix on Pacific yew also is overly optimistic about the likelihood of alternative taxol sources developing and replacing natural yew resources derived from Region 6 National Forests. Taxol synthesis, partial synthesis, tissue culture, and cultivated yew plantations are certainly being explored, but, contrary to the statement in the Appendix, none of these sources are likely to come on-line to supply significant quantities of taxol by 1995.

Reply - This is addressed in the response to the last comment on page L-A-54 of the FEIS which states: "Due to the current high interest by the National Cancer Institute in Pacific yew, and specifically taxol, a substantial amount of funding is being expended to determine if taxol can be produced synthetically. The National Cancer Institute, as well as the Forest Service, is optimistic that taxol can be produced from alternative sources in a relatively short period of time." In fact, considerable funding is going into several alternate sources of taxol by several companies, including taxol from cuttings, plantations of yew that will be completely utilized within four years, use of needles from ornamental yew, and tissue culture, in addition to synthetics. For example, the Department of Agriculture has entered into a Cooperative Research and Development Agreement with Phyton Catalytic Inc., Ithaca, N.Y. to optimize the cell culture process. A French firm is conducting clinical studies on a taxol-type product obtained from yew needles. The expectation of those involved with taxol, including Bristol-Meyers Squibb, is that alternate sources will meet the taxol needs within the timeframes stated.

Additionally, the response to the last comment on page L-A-55 of the FEIS states: "The overall management of Pacific yew is outside the scope of this EIS. The alternatives do not affect yew other than to potentially reduce its accessibility. Management of Pacific yew is the subject of a separate EIS now being prepared."

- 24b. DEIS Appendix I-2 discusses the environmental consequences of the alternatives on the Pacific yew. One significant concern is missing. What about the spotted owls use of the Pacific yew? The Rogue River National Forest has done some work on the role of the yew tree in the forest ecosystem, and they have reported that spotted owls use yew trees as a cool perch during the warm summer

months. The yew tree's slow growth means that they persist for a long time as a mid-level in the understory.

Reply - This is addressed in the response to the first comment on page L-A-54 of the FEIS which states in part: "The text of the FEIS has been expanded to acknowledge the use of understory yew trees by spotted owls...." This refers to the addition of a paragraph on page I-2 of Appendix I that states: "There is limited published information on spotted owl use of Pacific yew habitat. In a 1975-76 study, yew was frequently used for roosting by spotted owls even though it was an uncommon component in most stands (Forsman, Pers. comm.) A Pacific yew environmental impact statement is currently being developed to address the issue in more detail."

- 24c. ISC-352 mentions the possibility of under-planting for a second tree layer. Yew trees would contribute significantly to structural diversity and make an ideal underplanting species, because of their slow growth and long life. The FEIS should explore these interrelationships and disclose the impacts of the alternatives on the relationship between owls and yew trees.

Reply - This is addressed in the response to the first comment on page L-A-54 of the FEIS which states in part: "The text of the FEIS has been expanded.....to note that the Forest Service is scheduling plantings of Pacific yew." This refers to the addition of the following text on page I-2 of Appendix I which states: "Yew plantings are now being prescribed on National Forests." It should be noted, however, that proposals to artificially introduce yew as an understory species in stands within HCAs would be subject to the same silvicultural research and demonstration requirements as any other silvicultural proposal within HCAs. That process is described in Appendix R and S of the ISC Report.

- 24d. In "Questions and Answers on A Conservation Strategy for the Northern Spotted Owl" (USFS, PNW Research Station, Feb 1991), question 100 on page 59 discusses the harvest of special products from HCAs. The FEIS should specifically address the harvest of Pacific yew in HCAs. It might be useful to address yew needles and yew bark separately, because bark harvest is lethal to the tree, and needle harvest may not be lethal. Although ONRC does not want to limit the harvest of Pacific yew for taxol extraction, the FEIS should recognize that even needle harvest may not be consistent with spotted owl habitat needs, because of the yew tree's unique and important contribution to the complexity of old-growth forest structures.

Reply - This was addressed in the reply to comments 24-24c above. Additionally, the following paragraph was added to page I-2 of Appendix I, FEIS, which states: "Past harvest of yew has been in association with other commercial timber harvest units. Future taxol acquisition may involve individual yew harvesting outside timber harvest units, partial bark harvest from live yew, bough cutting for needles, and other techniques." There is a myriad of resource management activities that may or may not be conducted within HCAs. An Oversight Team and Steering Committee has been set up within the Forest Service to help determine if proposed activities are consistent with the ISC Strategy. A reference to such future determinations is intended on

page I-2 of the FEIS in the statement: "The effect is reduced if standards and guidelines permit access and management of individual yew trees." In other words, it is understood that the Oversight Team may in fact determine that a proposed Pacific yew needle harvest may not be consistent with spotted owl habitat needs. Additional NEPA analysis will be conducted before any ground disturbing or habitat modifying actions occur.

25. DEIS 3&4-103, we find it interesting that a large number of the mammals closely associated with late-successional forests are bats. The FEIS should expand on this phenomena, and explain any interrelationships between owls and bats and explain the impacts of the proposed action on bats.

Reply - Further information on bats can be found in the literature cited, see FEIS Chapter 3&4 - 135 for citations. For the discussion of environmental consequences for bats see FEIS Chapter 3&4 - 139.

26. DEIS 3&4-106 addresses wildlife species within the range of the spotted owl that are associated with early-successional forest ecosystems. This section should be expanded to distinguish between naturally regenerating forests and managed plantations and the abundance of species associated with each. How will the various alternatives affect the viability of species associated with young naturally regenerating forests, such as songbirds, small mammals, and amphibians? What will be the rate of occurrence of blowdowns and fires in areas where salvage sales will be prohibited? Should salvage sales be prohibited in the forest matrix to enhance development of young diverse forest types characteristic of naturally regenerating forests?

Reply - This is addressed in the response to the third comment on page L-A-63 of the FEIS (as clarified by the errata sheet) which states: "With the standards and guidelines contained in each Forest Land and Resource Management Plan, there should be no difference in the number of wildlife species between naturally regenerated stands and managed plantations. However, on many National Forests there will be a difference in the abundance of wildlife between naturally regenerated stands and managed plantations. The reason for this difference is that although the standards and guidelines require that snags be retained and downed woody material left to benefit wildlife, the number and distribution of snags and downed woody material is typically less in managed plantations than what occurred in the natural stand. Blowdown is a natural occurrence and cannot be accurately predicted."

It is also addressed in the response to the second comment on page L-A-63 of the FEIS which states: "Species that rely on early-successional forests will not find many areas within HCAs, or other designated areas for other alternatives, compatible with their habitat needs after these young forests mature. Losing habitat for some species in the HCAs to provide needed habitat for the northern spotted owl is a tradeoff that is understood and accepted. Timber harvest will not be increased in the Forest Matrix to compensate for the designation of areas managed primarily for owl habitat. The habitat in the intervening lands (Forest Matrix between HCAs) will be managed in accordance with Forest Land and Resource Management Plans and according to the 50-11-40

rule. Such lands will provide habitat conditions favorable for early-successional species."

27. At DEIS 3&4-119 there is a statement that alternative B will have a very-low to low probability of maintaining viable populations of sensitive fish stocks. Implicit in this statement is the fact that present management direction is not maintaining viable populations of sensitive fish species. Rather than go through the sequence of mismanagement and court orders which brings us to this point on the spotted owl, the Forest Service should immediately prepare an EIS on new standards and guidelines to maintain viable population of fish species, such as the native trout species, the endemic anadromous species and the endangered Klamath Basin species.

Reply - Refer to the response to the third comment on page L-A-65 of the FEIS which states: "The alternatives analyzed by the the Scientific Panel are not identical to Alternatives A and B in this environmental impact statement, and thus the statement in the Draft may overstate the risk. The alternatives analyzed by the Scientific Panel combined Forest Service and Bureau of Land Management managed lands, and estimated the consequences of the management of these lands under each agency's own management direction. As such the statement may well overestimate the threat to sensitive fish stocks from management of National Forests under these alternatives. There is insufficient information in the Scientific Panel's report to extrapolate the viability contribution of National Forest activities.

"The information from the Scientific Panel's report was included in this EIS to acknowledge the Panel's view of the potential risk to sensitive fish stocks. It was not intended to be the interdisciplinary team's viability assessment for sensitive fish stocks; a viability analysis was not conducted for any species other than the northern spotted owl.

"Until more detailed analysis is conducted (analysis that is outside the scope of this EIS) the general effects predicted in this EIS are accurate. They assume the effectiveness of the Forest Plan management direction in protecting water quality, riparian areas, and aquatic habitat. Alternatives B, C, D, and E all disturb less soil and would result in less threat to aquatic resources than Alternative A."

27. (continued) Same for the Marbled Murrelet (sic).

Reply - This is addressed in the response to the first comment on page L-A-63 which states: "This environmental impact statement displays the number of murrelet sites protected with each alternative across the range of the northern spotted owl." For further discussion, see the response to Paragraph 1 above.

28. The environmental consequences of open pit mining for porphyry copper in HCAs are never disclosed in the discussions on DEIS 3&4-121-123. If there are valid claims for locatable minerals within HCAs, and if the right to mine those claims is a vested right that the Forest Service cannot regulate to such an extent to make the claim unprofitable, then the impacts of open pit mining must be disclosed in detail.

Reply - This is addressed in the response to the last comment on page L-A-69 of the FEIS which states: "The predictions and estimates cited in this EIS point to a presence of three or four porphyry copper deposits within HCAs, with something below that number likely to be commercially developed. Although the opportunities to mitigate the effects of an ongoing open pit mine in spotted owl habitat may be limited, the area potentially involved is small compared to the amount of area included in designated areas managed primarily for spotted owl habitat. Proposals will be analyzed in a separate environmental analysis under NEPA (36 CFR 228), with the impact and mitigation addressed on a site-specific basis, and considered by the Oversight Team. Mitigation might include the addition other acres to the designated area."

This is also addressed in the response to the third comment on page L-A-69 of the FEIS which states in part: "Management of surface resources on mining claims within the designated areas has always been and will continue to be subject to case-by-case evaluation. The guiding principle will be to avoid detrimental effects to spotted owl habitat wherever possible."

29. DEIS 3&4-126. Will visual corridors be impacted through increased cutting to compensate for ASQ lost to owl habitat?

Reply - This is addressed in the response to the third comment on page L-A-44 of the FEIS which states: "There will be no increase in timber harvest in visual corridors. The Forests will manage the visual corridors according to the standards and guidelines as stated within the Forest Plans. Visual quality objectives will not be modified to compensate for the reduced ASQ resulting from designating areas managed primarily for spotted owl habitat." In fact, the section in the DEIS titled "Lack of Opportunities to Mitigate ASQ Effects Through More Intensive Management" (page 3&4 90-91), which is essentially repeated in the FEIS on pages 3&4 119-120, specifically addresses this issue.

30. DEIS 3&4-126, 3&4-159. What ski areas and proposed ski area expansions will be impacted under alternative B? What will be the impact? Cancellation? Modification?

Reply - This information is presented in the FEIS on page 3&4-166.

31. DEIS 3&4-127. What funding limits will prohibit road closures? Doesn't NFMA require that unnecessary roads be closed?

Reply - This is addressed in the response to the first comment on page L-A-72 of the FEIS which states: "The Forest Service is required (36 CFR 219.27) to plan and design to reestablish vegetative cover on roadways unless the road is necessary for future resource management activities. The sudden increase in the number of roads needing closure under alternatives designating large areas to be managed primarily for spotted owl habitat, and the sudden exclusion of timber sales and related funding from these areas, could result in a road closing workload in excess of available funding."

32. DEIS 3&4-163- Existence Values. In reporting on recent studies of the non-use value of spotted owls, we note a hint of skepticism in the authors when they find it necessary to say "there is a need for replication of the results."

Reply - This statement was removed and the results of these theoretical studies are shown in the FEIS.

33. DEIS 3&4-163 fails to aggregate the average person's willingness to pay higher taxes and higher prices for wood products. There is unnecessary skepticism here also. Why do the authors say "these two studies still have some methodological problems ... therefore, their results remain unsettled."

Reply - This statement was removed and the results of these theoretical studies are shown in the FEIS. The FEIS displays an aggregation of values nationwide.

34. DEIS 3&4-166 identifies as one of the social effects of alternative B the "loss of trust in federally assured timber supplies." This "trust" was actually an illusion. Since when does the federal government ever assure supplies of public resources to private enterprises? There was never any contract to supply a certain amount of timber in perpetuity while excluding all other forest values. The Multiple Use Sustained Yield Act, one of Congresses [sic] earliest forest management acts of the modern era, required the Forest Service to provide a sustained yield of all the multiple resources (including spotted owls) not just timber. The only conclusion to be drawn is that for many years the timber dependent communities got more than they bargained for. They got artificially inflated ASQs while the other forest values suffered. Spotted owls suffered to the extent of being threatened with extinction.

Reply - This is addressed in the response to the first comment on page L-A-78 of the FEIS which states: "All allowable sale quantities (ASQ) established for the National Forests affected by the spotted owl habitat management are based on non-declining even flow, and are equal to or below the long-term sustained yield capacity."

In addition, the sustained yield of all forest resources was addressed in the individual Forest Plans which established those allowable sale quantities.

34. (continued) Another social effect of the new standards and guidelines for spotted owl management (which was not disclosed) is a small measure of restoration of the public trust in federally assured wildlife supplies.

Reply - This comment does not lend itself to a specific reply.

34. (continued) Furthermore, "open conflict over cultural values" is not an adverse impact; such open conflict over values is healthy for an evolving and dynamic culture.

Reply - While "open conflict over cultural values" may be healthy for an evolving and dynamic culture, it is an adverse impact to small communities under stress. The impact was identified as one of several adverse impacts on timber-dependent communities.

35. DEIS Appendix H says that active FERC applications are present in areas to be managed primarily for spotted owl habitat. What projects are pending? Where are they? What environmental restrictions will the Forest Service apply to new FERC projects in HCAs? Standards and Guidelines must anticipate and respond to this potential development activity.

Reply - This is addressed in the response to the last comment on page L-A-21 of the FEIS which states: "Question 6 of the second set of questions and answers (Thomas 1991) notes: "Such activities as small hydroelectric projects,...may or may not significantly affect the quality of owl habitat. These should be considered on a local basis using local knowledge to assess the effects of the proposals." Information regarding the current status of applications can be best obtained from the appropriate Regional, Forest, or Ranger District Office. Some of these may be referred to the Oversight Team for evaluation of their consistency with the selected alternative."

36. The ISC report and the DEIS mention an "interagency technical body organized to review implementation of the conservation strategy" (ISC-325, ISC-361). If the Forest Service is the only agency formally implementing the ISC strategy, how will the "interagency body" be organized? In the FEIS, explain more about this body, its functions, and its authority.

Reply - The interagency Technical Review Team was organized in November 1990. Additional information is presented in the FEIS on page 2-35.

RESPONSE TO COMMENTS FROM PILCHUCK AUDUBON SOCIETY

The following are comments received from the Pilchuck Audubon Society on the Draft Environmental Impact Statement on the Northern Spotted Owl, dated December 10, 1991. Each comment is numbered and followed by a response.

[*A1] The following are Pilchuck Audubon Society's comments on the Draft EIS on the Management of the Northern Spotted Owl in our National Forests. Our organization has approximately 1200 members. We have a very active Forest Practices Sub-committee which has been working with local Ranger Districts for several years. We have participated on an I.D. Team (scoping on a timber sale), commented on EA's [sic] and EIS' [sic], worked on wildlife enhancement projects, reviewed timber sales, and mapped old growth, spotted owl locations and other "resources" for projects dealing with preserving the remaining natural forests and protection of watersheds. We have commented on all of the studies and reports and maps that have come out on the spotted owl. We have also talked to some of the biologists involved in these projects. This should give you some insight into our knowledge and background on the issue of protecting the Northern spotted owl.

Reply - This comment does not lend itself to a specific response.

[*A2] In reviewing the Draft EIS we believe that Alternative D best reflects how and what to protect for the owls continuing existence as well as other important "resources". We do have several specific comments which follow.

Reply - This comment does not lend itself to a specific response.

[*A3] We noticed that there is nothing in the EIS to reflect the District Biologist's modifications to the ISC maps. These areas were somehow overlooked. They are critical to many isolated areas of owls. Many of these areas provide important connections for the owls and need to be included in any final plan.

Reply - The original ISC maps were used without modification. This issue is addressed in the response to the 2nd comment on page L-A-20 of the FEIS which states: "Chapter 2 of the FEIS presents information on the "Adjustment Process" and on "Implementation". Proposed changes are all evaluated for consistency with the selected strategy, and subject to the NEPA process and administrative appeals, before implementation. The requirement of consistency with the strategy combined with environmental analysis and involvement and notifications of agencies and the public, assure that the changes will be either favorable or neutral in their effects on the viability of the northern spotted owl".

Further information on this issue is addressed in the Introduction on Major Additional, or Modified, Alternatives on page L-A-12 of the FEIS which states: "During the comment period many people and organizations offered ideas for new,

different, or modified alternatives. They included suggestions for changes in the general management of the National Forests, site-specific changes to boundaries of HCAs and standards and guidelines, sub-regional forest management strategies, the reexamination of Forest Plans for all or specific resource management, and suggestions for major policy or legislative changes. Others requested alternatives that, in the DEIS, were considered but eliminated from detailed study.

"As noted in Chapter 1, this environmental impact statement is sharply focused on providing management direction that will ensure the viability of the northern spotted owl. Many requests would require more time than the injunction established, or greater authority than the Forest Service has. This environmental impact statement responds to the need for management direction on National Forests throughout the range of the northern spotted owl. Requests to consider site-specific modifications or special sub-regional management strategies are too limited in scope for inclusion in this programmatic environmental impact statement.

"Many of the alternatives suggested are ideas that should be explored in other contexts. Some should be raised as Forest Plans are completed, amended, or revised. Others would have to be examined in the research and monitoring of spotted owl populations, habitat, and habitat management. Others can be addressed in the process of making minor adjustments and clarifications as these standards and guidelines are implemented. And some would require the revision of federal laws."

[*A4] Depending on the Interagency Scientific Report (ISC) and hoping for a 50% survival rate is dangerous. With the potential global climate change and other natural occurrences such as fire, a population could be wiped out in a matter of minutes reducing this 50% rate to much less. If anything the HCA's are too small for the owls [sic] continued existence. All owls found need to be protected. Every gene from every owl is becoming critical.

Reply - The reference to a 50% survival rate is not documented. If the concern is that the spotted owl population will decline, then this issue has been addressed by both the ISC and the EIS. In the FEIS, habitat capability is expected to be 74% of the current capability under Alternative B. Further, the claim that the HCAs are too small is unsubstantiated. Given the pattern of habitat areas that would be designated for the spotted owl, coupled with the research and monitoring program and other factors that are a part of the strategy, there is a high probability that the spotted owl will persist. There is some degree of risk to the owl, and this is explained as part of the definition of the viability ratings.

[*A5] During a meeting with one of the biologists who worked on the ISC report he informed us that there was concern for all the spotted owls in the Mount Baker-Snoqualmie National Forest. This was due to their isolation and problems with their food supply. The entire south half of the forest is in checkerboard ownership and I-90 has created a bottleneck for many wildlife species.

Reply - This issue is addressed in the FEIS on page 3&4-67 which shows that under Alternative B, there will be 1,391,000 acres designated in the North

Cascades area of concern. Of that acreage, 679,000 acres are currently spotted owl nesting, roosting and foraging habitat. The I-90 corridor was recognized by the ISC as being an area of concern and habitat conservation areas were delineated with local knowledge of the situation.

[*A6] This means we should provide even more protection for the owls. One of the ways to accomplish this is to examine the protection provided by the Scientist's Report to the U.S. House of Representatives which would save 28% more owls than the ISC report. (This is the report done by the "Gang of 4" for Congress earlier this summer.) After reviewing this report it seems that protection of LS/OG1 + owl additions + LS/OG2 additions + watershed/fish emphasis will prevent future catastrophes to "public resources".

Reply - The Scientific Panel on Late-Successional Forest Ecosystems (Johnson et al. 1991) developed 14 "Alternatives for Management of Late-Successional Forests of the Pacific Northwest." The Scientific panel offered initial estimates of the effects of each of these alternative on old-growth dependent wildlife, timber harvest, and the economy. The Panel of four (including Jack Ward Thomas) analyzed and reported the alternatives and effects in less specificity and detail than either the ISC Report or this EIS. The panel's charge was to develop options with indications of the consequences. Wide in its scope, the report lacked sufficient specificity to contribute significantly to the analysis of environmental effects for this EIS.

This issue is also answered in part in reply to *A3 above in the excerpt from page L-A-12 of the FEIS.

It is also addressed in the responses to the first and second comments on page L-A-16 of the FEIS, which state: "The DEIS and the FEIS both display the environmental effects of the alternatives on existing old-growth stands and associated wildlife species, and it was one of the elements used on comparing the alternatives. Developing and presenting an alternative to manage ecosystems or resources not directly tied to management for the northern spotted owl is outside the scope of this environmental impact statement.", and "This type of alternative was considered but eliminated from detailed study in this environmental impact statement. See that section at the end of Chapter 2."

[*A7] There is great concern that not enough emphasis is given to adjacent lands and what occurs on them. Most of these private and state-owned lands are not managed for forest-dependent species. Many need to be bought or traded. Checkerboard ownership such as in the North Bend Ranger District of the Mount Baker-Snoqualmie National Forest has led to extreme fragmentation of forest habitat.

Reply - Land exchanges will be considered to improve existing HCAs, Chapter 2-31. Further discussion on private lands is presented on pages 3&4-51 and 52 of the FEIS and is also discussed in the response to the 2nd comment on page L-A-30 which states: "The standards and guidelines for the ISC Strategy identify a need for the consolidation and acquisition of land within HCAs to better manage northern spotted owl nesting, roosting, and foraging habitat." Also, see the response to the 3rd comment on page L-A-30 which states: "We do assume that some nesting, roosting, foraging and dispersal habitat will come

from private lands because of the protection measures afforded species listed as either Threatened or Endangered under the Endangered Species Act."

[*A8] This area needs to be rehabilitated and protected. Alternative D seems to provide for this protection.

Reply - This concern is also addressed in the reply to *A5 above.

[*A9] Alternative D is the only alternative providing for population viability. It is our understanding that this means it provides for the continued existence of the spotted owl. We find this to be a crucial point.

Reply - This is unsubstantiated and contrary to the assessments of the ISC and the EIS. In the EIS, Alternatives B, C, and D were rated as providing for a high likelihood of a viable population.

[*A10] We are greatly concerned that you mention adding a timber industry alternative to the Final EIS. No alternative should appear that is not based on science. The ISC recommendations are the very minimum alternative with some scientific credibility (although this is already outdated science). We strongly object to a proposed alternative by an industry dedicated to "business as usual" which includes the demise of old growth dependent wildlife, plant and fish species.

Reply - The industry Multi-Resource Strategy was not recommended as the preferred alternative because it was rated as having a low likelihood of providing for a viable population of spotted owls. This issue was addressed in L-A-19 in the response to the first comment which states: "The alternative was included because it: a) was requested by a large number of respondents, b) proposed management prescriptions in sufficient detail that its environmental effects could be evaluated, c) was a management proposal that might have met the purpose and need of the proposed action.

"The interdisciplinary team's principal focus was in assessing the environmental and viability effects of the alternative's standards and guidelines in the National Forests. The adequacy of the scientific basis supporting the proposal was not a principal question addressed by the interdisciplinary team, as the interdisciplinary team was expressly concerned with the environmental consequences including the viability of the spotted owl, of managing the National Forests with the management direction proposed. The Strategy has been sent to a number of recognized scientists for an independent peer review in order to obtain a review of its scientific credibility.

"The alternative's ability to adequately respond to the purpose of ensuring the viability of the owl could not be determined without analysis".

[*A11] After spending many hours working on the ancient forest issue it is imperative the spotted owl receive the strongest protection possible at this time if it is to survive for future generations.

Reply - This comment and opinion appear premised on an unstated assumption that the current numbers and currently available habitat of northern spotted owls are the cause for the determination of its Threatened status. The Final Rule,

pursuant to the Endangered Species Act, which listed the northern spotted owl as threatened makes it clear that it is the foreseeable rate and pattern of future habitat loss that has led to the northern spotted owl's listing as a Threatened Subspecies (55 FR 26182). Alternatives B, C, and D in the DEIS all slow this rate of loss; all provide for a high likelihood of viability. All three alternatives maintain a viable population of the northern spotted owl; all three alternatives meet the challenge faced by the agency; all meet the underlying need of this environmental impact statement.

The following is a verbatim representation of a comment addendum received from the Pilchuck Audubon Society dated December 23, 1991.

[*A12] Since writing that letter we have received a copy of the "Multi-Resource Strategy for Conservation of the Northern Spotted Owl" compiled by industry biologists. This "strategy" does not provide for the continued viability of the Northern spotted owl, but rather is an industry approach that looks to have its cake and eat it too, in a similar way to the past and failed Yeutter Task Force. We have not found it worth our time to do an intense evaluation of a report which is not based in valid science. Nevertheless, we do have a few comments based on our specific knowledge of the Mt. Baker-Snoqualmie National Forest. This alternative neglects to include most of the known reproductive owl pairs in the Mt. Baker-Snoqualmie National Forest, yet as we stated in our original letter, many biologists feel that all known owl pairs, and in fact all owl habitat, on the MBS should be protected.

Reply - This concern is addressed in the reply to *A5 and *10 above.

[*A13] Their entire proposal is based first on economics and second on biology, this, for example, allowing for continued timber harvest in areas where Plum Creek and Boise Cascade has timber land (along the I-90 corridor, for example). Each of the scientists works directly for the timber industry (examples again of Plum Creek and Boise Cascade biologists), creating a conflict of interest in their recommendations. For the Forest Service to even consider their proposal is unconscionable. Since their proposal is less than even the ISC Report, it encourages the ultimate, and unfortunately rather rapid, extinction of the Northern spotted owl. One assumes, however, that because the Forest Service will show this as an alternative in the FEIS, that this alternative will be treated by the Forest Service in an identical manner to other alternatives, i.e., that industry information will not be used as submitted, but that reputable biologists on the Northern spotted owl EIS team will review this alternative and evaluate this alternative accordingly.

Reply - The environmental consequences of the industry Multi-Resource Strategy were analyzed using the same methodologies and data as were used in analyzing Alternatives A through D.

[*A14] With scientific evidence continuing to accumulate which shows that the entire natural forest ecosystem is in severe stress, and that an ever-increasing number of plants and animals dependent on these ecosystems are threatened or endangered, extreme caution must be employed when crafting a plan for the continued viability of the owl. This proposal has a counter-effect and aims at caution in terms of decreased timber harvest.

This is unacceptable, and is illegal under NFMA, NEPA, and the MBTA, at a minimum. In summary we feel that this alternative should not be included in the FEIS.

Reply - The analysis and disclosure of effects of the Multi-Resource Strategy is not illegal.

[*A15] The Sierra Club Legal Defense Fund has submitted a number of concerns on the draft EIS for the plaintiffs on the Spotted Owl lawsuit. As one of the plaintiffs, our organization agrees with all these comments. Any comments we have made in our two letters are in addition, but not in contradiction to their letter.

Reply - This comment does not lend itself to a specific response.

RESPONSE TO COMMENTS FROM PORTLAND AUDUBON SOCIETY

The following are of comments received from the Portland Audubon Society on the Draft Environmental Impact Statement for management of the northern spotted owl, dated 12/17/91. Each comment is numbered and is followed by a response.

[*U1] I am writing on behalf of the Conservation Committee of the Portland Audubon Society, a 7000+ member chapter of the National Audubon Society dedicated primarily to the protection of wildlife and wildlife habitat. Our members have a strong interest in seeing the US Forest Service take steps to assure the survival of the Spotted Owl with a high degree of certainty, based on the best available scientific information. We have been participants in many of the administrative and legal processes leading up to the production of this EIS; we have studied the EIS; and we appreciate this opportunity to comment.

Reply - This comment does not lend itself to a specific response.

[*U2] In our view, only alternative "D: provides assurance of protection of Spotted Owls and other old growth species. While we realize that a court ordered deadline is an issue, we nonetheless feel that the Service should prepare a supplemental EIS to analyze an alternative that would give full protection to the areas identified in "Alternative 12" of the Scientific Panel on Late-Successional Forest Ecosystems. Accordingly, we urge you to select alternative D, or better yet, prepare a supplemental EIS to analyze "Alternative 12".

Reply - This issue is addressed in the Introduction to Major Addition, or Modified, Alternatives on page L-A-12 of the FEIS which states: "During the comment period many people and organizations offered ideas for new, different, or modified alternatives. They included suggestions for changes in the general management of the National Forests, site-specific changes to boundaries of HCAs and standards and guidelines, sub-regional forest management strategies, the reexamination of Forest Plans for all or specific resource management, and suggestions for major policy or legislative changes. Others requested alternatives that, in the DEIS, were considered but eliminated from detailed study.

"As noted in Chapter 1, this environmental impact statement is sharply focused on providing management direction that will ensure the viability of the northern spotted owl. Many requests would require more time than the injunction established, or greater authority than the Forest Service has. This environmental impact statement responds to the need for management direction on National Forest throughout the range of the Northern spotted owl. Requests to consider site-specific modifications or special sub-regional management strategies are too limited in scope for inclusion in this programmatic environmental impact statement.

"Many of the alternatives suggested are ideas that should be explored in other contexts. Some should be raised as Forest Plans are completed, amended, or revised. Others would have to be examined in the research and monitoring of spotted owl populations, habitat, and habitat management. Others can be addressed in the process of making minor adjustments and clarifications as these standards and guidelines are implemented. And some would require the revision of Federal law".

Additional information is found in the second paragraph on page 2-73 of the FEIS which states in part: "Alternatives presenting an old-growth forest management plan, or focusing on the management of other old-growth associated wildlife species, were not studied in detail. All old growth is not spotted owl habitat; all spotted owl habitat is not old growth. While an alternative that would provide management direction for old-growth forests and wildlife species would provide management direction for habitat for the spotted owl, it would impose greater change on Forest management and the economy than necessary to meet the underlying purpose and need of the proposed action..."

[*U3] We are also aware that a plan called "A Multi-Resource Strategy for Conservation of the Northern Spotted Owl" has been prepared by the National Forest Products Association and the American Forest Council in response to this EIS. From what we have been able to determine, this proposal lacks scientific credibility, is extremely high risk for the owl, as its inclusion in a final EIS without an opportunity for general public review and comment, may be a violation of NEPA. We urge you not to consider this "strategy" in the final version of this EIS, although we have no objection to consideration of the industry "strategy" in a supplemental EIS that also includes "Alternative 12".

Reply - This issue is addressed in the response to the first comment on page L-A-19 of the FEIS which states: "The alternative was included because it: a) was requested by a large number of respondents, b) proposed management prescriptions in sufficient detail that its environmental effects could be evaluated, c) was a management proposal that might have met the purpose and need of the proposed action.

"The interdisciplinary team's principal focus was in assessing the environmental and viability effects of the alternative's standards and guidelines in the National Forests. The adequacy of the scientific basis supporting the proposal was not a principal question addressed by the interdisciplinary team, as the interdisciplinary team was expressly concerned with the environmental consequences including the viability of the spotted owl, of managing the National Forests with the management direction proposed. The Strategy has been sent to a number of recognized scientists for an independent peer review in order to obtain a review of its scientific credibility.

"The alternative's ability to adequately respond to the purpose of ensuring the viability of the owl could not be determined without analysis."

Further, the response to the first comment on page L-A-10 of the FEIS states: "The Forest Service chose to include the Multi-Resource Strategy as an alternative in the FEIS in order to disclose information about its effects on the environment and on the viability of the northern spotted owl.

"The CEQ's Regulations state at 40 CFR 1502.9(c) that, 'Agencies shall prepare supplements of either draft or final environmental impact statements if (i) the agency makes substantial changes in the proposed action that are relevant to environmental concerns; or (ii) there are significant new circumstances or information relevant to environmental concerns or bearing on the proposed action or its impacts.'

"The Forest Service has made no change in its proposed action (Alternative B) that is relevant to environmental concerns, and it does not see the information disclosed in assessing the consequences of Alternative E to be significant new information relevant to environmental concerns and bearing on the proposed action or its impacts.

"The CEQ's "Forty Most Asked Questions Concerning CEQ's NEPA Regulations" provides some additional guidance on the necessity of issuing a supplement to the DEIS in this case. Question 29b says if the alternative suggested by the reviewer is a variation of an existing alternative, and is qualitatively within the spectrum of the alternatives discussed in the DEIS, a supplemental DEIS is not needed.

"Alternative E (the Multi-Resource Strategy) is similar in many ways to Alternatives B, C, and D presented in the DEIS. They all: a) designate areas managed primarily for spotted owl habitat that provide for multiple pairs of spotted owls, b) provide for special management of habitat between designated areas, c) call for research to determine silvicultural treatments best [for] spotted owl habitat and therefore for the owl, d) set minimal spacing distances between designated areas, e) abandon the SOHA strategy, and f) assume the continuation of Forest Plans (or Forest Plan completion) on the National Forests.

"Alternative E (the Multi-Resource Strategy) is clearly within both the qualitative and quantitative spectrum of the four alternatives in the DEIS, falling, in most analyses, between Alternative B and Alternative A in its environmental and management effects.

"Outlines for alternatives similar to the Multi-Resource Strategy were received before the DEIS was printed but were eliminated from detailed study because of insufficient time to develop them. However, the DEIS did note: "The interdisciplinary team will consider a proposal of this type for the Final Environmental Impact Statement," (DEIS, page 2-56).

"When the Forest Service received the Multi-Resource Strategy with standards and guidelines and a map, it was immediately mailed to parties in the SAS v. Evans lawsuit, and was available to any who requested it. It was also subjected to the same type of independent scientific peer review as the ISC Strategy.

"Members of the public and reviewing agencies and governments may submit comments on the FEIS to the Responsible Official through the address on the title page of the FEIS. The Record of Decision will not be signed before March 2, 1991 [sic]."

RESPONSE TO COMMENTS FROM SIERRA CLUB LEGAL DEFENSE FUND

The following are comments received from the Sierra Club Legal Defense Fund dated December 24, 1991, on the Draft Environmental Impact Statement for the Northern Spotted Owl. Comments are numbered and followed by a response.

[*S1] These comments on the Draft Environmental Impact Statement on Management for the Northern Spotted Owl in the National Forests ("DEIS") are made on behalf of Seattle Audubon Society, Washington Environmental Council, Washington Native Plant Society, Pilchuck Audubon Society, National Audubon Society, Portland Audubon Society, Lane County Audubon Society, Oregon Natural Resources Council, Siuslaw Task Force, and The Wilderness Society (collectively "SAS"). In summary, the DEIS does not reflect any serious attempt by the Forest Service to comply with the National Environmental Policy Act's ("NEPA") requirements and goals nor does the preferred alternative assure the northern spotted owl's continued viability, as required by the National Forest Management Act ("NFMA").

Reply - We disagree with this characterization of the EIS.

[*S2] The DEIS fails entirely to address risk and uncertainty associated with the agency's analysis and preferred alternative;

Reply - This issue is addressed in the response to the third comment on page L-A-5 of the FEIS which states: "The analysis of the viability of the northern spotted owl is a risk analysis. The analysis of the probability of viability (or persistence) is the same analysis that yields the probability of disappearance. The disclosure of a "low probability of viability" is synonymous with a "high risk (or probability) of disappearance."

"The viability (or risk analysis) was evaluated using the theoretical approaches and research methods generally accepted in the scientific community (see "Population Viability" in Chapter 3&4). The FEIS (and DEIS) did disclose the risk of the different management plans (alternatives) to the viability of the northern spotted owl.

"The DEIS and FEIS did disclose that there is uncertainty about the precision of the estimates of the effects of the alternatives. This was presented in the section "Incomplete and Unavailable Information" at the beginning of Chapter 3&4.

"The ISC Report, which is the basis for Alternatives B, C, and D and is incorporated by reference, includes a 16 page appendix on Viability Risk Assessment (Appendix T of that document)."

[*S2 cont] risks on which the court in Seattle Audubon Society v. Evans, 771 F.Supp. 1081 (W.D. Wa. 1991), relied to enjoin the Forest Service from logging spotted owl habitat. See Section I(A). The DEIS also fails to address scientific criticism of the Forest Service's preferred alternative, the Interagency Scientific Committee ("ISC") Plan. See Section I(B).

Reply - This issue is addressed in the response to the first comment on page L-A-23 of the FEIS which states: "The ISC Strategy for the northern spotted owl is scientifically credible for several reasons. First, the scientific method was used to develop the strategy. Strategies were tested and adjusted with the best available quantitative data and other information including modeling. Second, each member of the committee had credentials, experience, and reputations appropriate to the task. Third, published literature, reports and ongoing research was [sic] reviewed and considered when developing the strategy. Finally, the report was subject to thorough peer review by professionals selected by the following societies: The Wildlife Society, Society of American Foresters, Society for Conservation Biology, The American Ornithologists' Union, and The Ecological Society of America (USDA Forest Service 1991a, Question #15)."

This issue is also addressed in the response to the second comment on page L-A-23 of the FEIS which states in part: "In the court transcripts for SAS v Evans, Doaks, Orians, and Kareiva critique the ISC Strategy, particularly the modeling. Modeling was only a part of the ISC Strategy. The ISC utilized the best available information and professional judgement in the development of the ISC Strategy. It is the most scientifically credible plan for management of the northern spotted owl developed to date."

[*S2 cont] The preferred alternative does not ensure a viable population of Spotted owls is protected, as required by the National Forest Management Act. See Section II.

Reply - Based on the risk assessment in the ISC Report, pages 373-388, and the viability analysis in the FEIS, pages 3&4-39 through 100, the preferred alternative does provide for a viable population of spotted owls.

[*S2 cont] Finally, the Forest Service has failed entirely to address whether preserving the owl's viability is sufficient to achieve the underlying purpose of the plan -- the protection of the old-growth forest ecosystem. See Section III.

Reply - The protection of the old-growth forest ecosystem is not the underlying purpose of this management plan or this EIS. A management plan for spotted owl habitat should not be confused with a management plan for old-growth forests; this EIS has endeavored to make the distinction clear. This issue is also addressed in the response to the second comment on page L-A-5 of the FEIS which states: "The two underlying purposes of the proposed action are presented in Chapter 1. The differing levels of preservation of old-growth forests are consequences of the management direction for the northern spotted owl of the different alternatives."

[*S3] I. THE DEIS DOES NOT MEET THE FUNDAMENTAL REQUIREMENTS OF THE NATIONAL ENVIRONMENTAL POLICY ACT

Reply - See reply to *S4 through *S48 below.

[*S4] The primary purposes of an environmental impact statement are: (1) to provide decisionmakers with an environmental disclosure sufficiently detailed to aid in the substantive decision whether to proceed with the

project in light of its environmental consequences, and (2) to provide a full public disclosure of a project's environmental consequences and an opportunity for the public to participate in the review and discussion of these consequences. See e.g., Robertson v. Methow Valley Citizens Council, 109 S.Ct. 1835, 1845 (1989); Baltimore Gas & Electric Co. v. NRDC, 462 U.S. 87, 97-100 (1978); Citizens for a Better Henderson v. Hodel, 768 F.2d 1051, 1056 (9th Cir. 1985); Trout Unlimited v. Morton, 509 F.2d 1276, 1282 (9th Cir. 1974); Silva v. Lynn, 482 F.2d 1282, 1285 (1st Cir. 1973); Friends of the Earth v. Hall, 693 F.Supp at 922. These purposes insure that "stubborn problems or serious criticisms [are not] swept under the rug." Sierra Club v. Marsh, 714 F.Supp. 539, 549 (D. Me. 1989)(quoting Silva v. Lynn, 482 F.2d at 1285). The DEIS persists in sweeping serious problems under the rug and ignoring responsible criticism.

Reply - The environmental consequences of the alternatives are disclosed, the methodologies are standard or adequately described, the public has had a full opportunity to participate in the review, and the resulting comments and criticisms on the DEIS and responses to them are available in pages L-A-1 through L-A-90 of Appendix L.

[*S4 cont] Thus, it fails completely to accomplish either of the basic purposes of an EIS and does not meet the legal standards of NEPA.

Reply - We disagree with this characterization of the EIS.

[*S5] The critical defects in the DEIS are many and fundamental. They arise out of the Forest Service's uniform failure to acknowledge meaningfully even the possibility that the predictions in the DEIS of the environmental consequences for the spotted owl of continued habitat destruction are uncertain or inaccurate.

Reply - This issue is addressed in the response to the first comment on page L-A-24 of the FEIS which states: "The Interagency Scientific Committee interpreted the data with recognition to uncertainties and assumptions. Assumptions must be made with any modeling effort. The best available empirical data was reviewed by the committee and uncertainties pertaining to the models were clearly identified in Appendix M of the ISC Report (Thomas et al. 1990). The viability ratings; HIGH, MEDIUM and LOW, account for degrees of uncertainty.

"Further, while quantitative analytical methods were used in the ISC Report, and in this EIS, these were not the only methods used to assess population viability. Professional judgement was relied upon after review of the best available empirical data. Therefore, any potential problems with the modeling effort is expected to be minimal.

"Monitoring, research and the Spotted Owl Recovery Plan, which is expected to be released this year, will provide information to test these assumptions thereby providing information necessary for adaptive management. Additional precautions will be provided by the project level consultation with U.S. Fish and Wildlife Service on actions that affect spotted owls and their habitat."

[*S5 cont] See Section A below. Yet the agency's predictions and the assumptions behind them have been criticized extensively by leading experts

in wildlife biology, population ecology, and population viability analysis. No hint of this criticism is disclosed, let alone addressed, in the DEIS.

Reply - "Criticized extensive" is unsubstantiated here by any references to specific expert criticisms. Therefore this claim cannot be directly confirmed or disputed. However, the issue of scientific credibility, which is the fundamental issue, has been established as stated in the response to the first comment on page L-A-23 of the FEIS, and is quoted in the reply to *S2 above.

[*S5 cont] See Section B below. As a consequence, the document neither informs the decisionmaker of the full range of likely consequences of the proposed action; nor does it disclose to the public the debate surrounding the agency's prediction of environmental effects. The DEIS simply makes its rosy and confident predictions for the owl's future viability and then ignores all countervailing risks and criticisms. Such agency arrogance is fatal in the NEPA process. See, e.g., Friends of the Earth v. Hall, 693 F. Supp. at 924-25, 931.

Reply - The environmental impact statement does inform the decision maker of the environmental effects of the proposed action. (There is no requirement to disclose a "full range of likely consequences".) The public debate is disclosed in several places in the DEIS, including the discussion of the issues on pages 2-1 and 2-2. The analysis of viability in the FEIS is a scientifically credible process, cognizant of the risks involved.

[*S6] A. The DEIS Does Not Disclose Uncertainty or the Potential Adverse Consequences of the Forest Service's Plans for Continued Destruction of Spotted Owl Habitat.

Reply - See the responses to *S7 through *S42 below.

[*S7] It is well established that federal agencies must disclose and address in an EIS the existence of scientific uncertainty and foreseeable risks regarding the environmental effects of a proposed action.

Reply - This issue is addressed in the response to the comment on page L-A-6 of the FEIS which states: "The existence of scientific uncertainty was disclosed in the section "Incomplete and Unavailable Information" at the beginning of Chapter 3&4. The foreseeable risks are disclosed throughout Chapter 3&4. The foreseeable risks to the viability of the spotted owl were presented in the viability analysis. The foreseeable risks to other aspects of the environment and the uncertainty surrounding estimates of consequences were addressed in narratives disclosing the environmental consequences (see, for example, the discussions and appendices on Fire and Fuels Management, and Insects and Diseases). Elsewhere, the uncertainty of estimates are clear in the language that describes the effects in conditional or approximate language rather than in absolute terms.

"As indicated in the section 'Incomplete and Unavailable Information' the interdisciplinary team examined the incomplete and unavailable information to see, in the language of 40 CFR 1502.22(a), 'If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among the alternatives'.

"The team concluded that the missing information was very unlikely to reverse or nullify established relationships, and therefore, not essential to a reasoned choice among the alternatives. (Therefore, the requirements of 40 CFR 1502.22(b) were not applicable, though the elements of that section are present in the environmental impact statement.)

"It is important to review the alternatives in light of the factors they incorporate which minimize the risk to spotted owl habitat and subsequently, the spotted owl.

"Each alternative moves at a slow pace. For example, with Alternative B, nesting, roosting, and foraging habitat would be reduced under the Forest Plan standards and guidelines by 0.15 percent annually in the first 50 years. The viability outlook at the 50-year mark is one of a very high probability of viability (Thomas et al. 1990: 39). Habitat conditions are projected to improve (Chapter 3&4, "Criterion 1, Potential Change, Alternative B").

"Each alternative incorporates a monitoring plan and an adjustment process to change management direction should new information indicate that habitat, or the spotted owl, is imperiled.

"Management activities in Critical Habitat are the subject of consultation with the U.S. Fish and Wildlife Service in all alternatives.

"The alternative selected would be reexamined with the release of the Recovery Plan, and the viability analysis would be reconsidered if the assumptions about management on other Federal lands were changed by the action of the Endangered Species Committee.

"Thus, information which is yet to be developed or more fully specified about spotted owls and spotted owl habitat is not essential to a choice now among the alternatives. The implications of the alternatives and their differences are clear in this environmental impact statement; additional unavailable information is not essential to a choice among them."

[*S7 cont] Indeed, the Council on Environmental Quality regulations that guide federal agency compliance with NEPA make this requirement explicit. See 40 C.F.R. s 1502.22.

Reply - This issue is addressed in the response to the comment on page L-A-6 of the FEIS and included in the reply to *S7 above.

[*S8] The Supreme Court has confirmed the importance of this regulation to the overall implementation of NEPA's basic goals of informed decisionmaking and a full environmental disclosure. See Robertson v. Methow Valley Citizens Council, 109 S.Ct. 1835, 1849 (1989). Similarly, the Ninth Circuit has confirmed that disclosure and discussion of risks and uncertainty are essential ingredients of an adequate EIS, see Northwest Indian Cemetery Protective Ass'n v. Peterson, 795 F.2d 688, 696 (9th Cir. 1986), rev'd on other grounds 485 U.S. 439, 108 S.Ct. 1319 (1988); Southern Oregon Citizens Against Toxic Sprays, Inc. v. Clark, 720 R.2d 1475, 1479 (9th Cir. 1983). Thus, the obligation that the CEQ regulation imposes

on the Forest Service to disclose risks and uncertainty surrounding its owl habitat management plan is neither insignificant nor merely formal.

Reply - The DEIS did disclose risk and uncertainties. See the reply to *S7 above.

[*S9] 1. The DEIS fails to disclose the threat associated with exceeding a viability threshold due to continued habitat loss proposed by the preferred alternative.

Reply - See the replies to *S10 through *S13 below.

[*S10] A major risk ignored entirely by the DEIS is associated with population viability "thresholds," which, if exceeded, can doom a species to a naturally irreversible decline.

Reply - The EIS did evaluate how the alternatives were likely to provide for a viable population. Thus, the EIS did explore the probability of ensuring that there is no irreversible decline in the owl population. However, specific thresholds cannot be identified. Hypotheses about the dynamics of spotted owl populations can be explored through the use of models. This was done as part of the ISC Report and is incorporated by reference into the EIS.

It is important to note that while specific thresholds cannot be identified, it is possible to develop a sound management strategy. The ISC Strategy is such a credible strategy, based on the best available data and developed by the experts in the field of spotted owl biology. The report was then thoroughly peer reviewed.

Further, literature that was cited in the ISC Report was incorporated in the EIS by reference, including a reference by Doak in Appendix M of the ISC Report. Additional unpublished literature and literature published since the ISC Report was reviewed and referenced in the EIS. See particularly Appendix D of the FEIS.

This issue is also addressed in the response to the last comment on page L-A-34 of the FEIS which states: "The absolute value which assures viability or precipitates extinction is unknown. It is not simply an absolute number of owls that could assure viability, the amount and pattern of habitat are primary factors in providing for a viable population."

"Research and monitoring of northern spotted owl populations will provide opportunities to evaluate management, and alter the current direction if needed. Management direction is conservative enough to allow detection of any adverse effects to spotted owls in sufficient time to use the adjustment process to preserve long-term viability."

A fundamental premise of the risk assessment and analysis in the EIS and the ISC was that viability should be evaluated on a gradient rather than identifying a single "threshold" point. Modeling can be used to explore the factors that influence population viability. Although mathematical models can be devised to show a precipitous decline in owl numbers as parameters vary, models are simplistic representations of the real world. It is not realistic

to use any one model to identify a specific population size or a specific amount of habitat that equates to threshold of assured security.

[*S10 cont] Three analyses have assessed the population dynamics of the spotted owl and the effect habitat amount and distribution has on the owl's population. SAS Exh. 3 at 5-6 (Doak); TR at 48 (Orians).⁴ These analyses found that rather sharp thresholds occur, which can lead to the ultimate extinction of the owl's population. SAS Exh. 1 at 252; SAS EXH. 3 at 5 (Doak). The DEIS discusses none of these analyses.

Reply - This concern is addressed in the reply to *S10 above. Further, the ISC scientists addressed the specific concerns of Drs. Doak, Orians and Kareiva during the evidentiary hearings for SAS vs Evans. A purpose of the EIS was not to specifically address individual criticisms but rather to consider all relevant information and to assess the viability of the owl under management alternatives. This was done in the EIS.

[*S11] One viability threshold results from the loss of habitat: if the amount of suitable habitat is too small a fraction of the landscape, then the difficulty owls have in finding a suitable territory becomes an insurmountable barrier to the population, resulting in death rates exceeding birth rates. SAS Exh. 1 at 252; TR ar 45-46 (Orians). The other threshold is also habitat related -- if population numbers fall too low (as a result of habitat loss or some other cause), then the probability of finding a mate drops below that required to balance birth and death rates. SAS Exh. 1 at 252; TR at 46 (Orians).

Reply - See the reply to S10 above and the response to the third comment on page L-A-33 which states: "The provision for large designated areas to be within close proximity to each other throughout the range of the owl, coupled with the other provisions in the ISC strategy, are more important for spotted owls than the absolute amount of habitat. A decline in spotted owl habitat was recognized by the Interagency Scientific Committee and is documented in this EIS [ISC Report, p.35, FEIS 3&4 53-64]. The decline in northern spotted owl nesting, roosting, and foraging habitat due to timber harvest is included in the calculations of potential change in owl habitat over time in the viability analysis, criterion 1. Although the amount of habitat will be less in the short term over all areas and permanently less in the Forest Matrix, both the ISC Report and the analysis in this EIS rate the viability of the northern spotted owl as HIGH in the long term in Alternatives B, C, and D. This HIGH rating is, in part, because the regrowth of habitat will exceed harvest rates under these alternatives."

[*S12] The precise location of these viability thresholds cannot be determined -- that is, the exact amount and distribution of habitat or the number of spotted owls required to assure a viable population is not known. SAS Exh. 1 253; TR at 47 (Orians). Nonetheless, with the proper analysis and interpretation of that analysis, one can estimate where these thresholds are likely to exist. TR at 47 (Orians). In addition, demographic statistics can indicate whether a population is exhibiting signs of being near, at, or beyond a viability threshold. TR at 47 (Orians); Noon Dep. Tr. at 74. But these indicia of population instability are likely to lag behind the causes of the instability because the owl is a long-lived species. Noon Dep. Tr. at 78; SAS Exh. 3 at 13 (Doak). In

fact, there are study areas whose owl populations display the population characteristics that are likely associated with being at, or approaching, a population threshold. Noon Dep. Tr. at 77-80; SAS Exh. 3 at 13 (Doak).

Reply - See the reply to S10 above.

[*S13] The DEIS fails entirely to discuss the concept of viability thresholds and the implications these thresholds have for the continued destruction of the owl's habitat, as proposed by the DEIS' preferred alternative. For this reason alone the DEIS is fatally flawed -- it does not inform the decision-maker and the public of this most serious risk to the spotted owl's viability.

Reply - The discussion on threshold in the reply to *S10 above applies here.

[*S14] 2. The ISC Plan Is An Untested Experiment.

Reply - As stated in the response to the first comment on page L-A-7 of the FEIS, "The ISC Conservation Strategy is based on theoretical approaches and research methods generally accepted in the scientific community comprised of those with expertise in the northern spotted owl. There are substantial mechanisms to make corrections to management actions should the outcomes vary from those predicted (see 'Adjustment Process' and 'Implementation' for the alternatives in Chapter 2)."

Any management plan that has not yet been enacted is "untested." Repercussions are serious if a plan contains faulty assumptions. However the ISC plan accounts for this by requiring an extensive inventory, monitoring, and research plan. This is the "testing" of the plan. Further, see Appendix J of the EIS and Appendix Q of the ISC Report for more information.

[*S15] The DEIS also does not disclose or even hint that the ISC Plan (upon which alternative B, C and D are based) is an untested, untried experiment in the management of a species acknowledged to be threatened with extinction. ISC Plan at 34.

Reply - The ISC strategy includes a monitoring and research program that is specifically designed to test the key assumptions and that was designed to directly address the uncertainties discussed here. The ISC strategy is incorporated by reference into the EIS. The EIS was written with full knowledge of the precautions and assumptions in the ISC.

[*S15 cont] This basic uncertainty introduces three significant risks that the DEIS has ignored: (1) there is a significant probability that the future distribution of the owl's habitat envisioned by the ISC will not maintain the owl's natural viability as a species, TR at 61-62 (Orians); SAS Exh. 3 at 7-11 (Doak); TR at 1192-93 (Karevia);

Reply - The EIS (and ISC) consulted with panels of scientists and spotted owl experts to assess qualitatively such probabilities. The ISC strategy ranked as "high" likelihood of success amongst all experts consulted on the probability of that strategy maintaining the viability of the northern spotted owl. However, this is still a likelihood and is not a 100% insurance. Further information is contained in the response to the first comment on page L-A-24 of

the FEIS (see reply to *S5 above) and the response to the last comment on page L-A-34 (see reply to *S10 above). This is also addressed in the response to the third comment on page L-A-33 (see reply to *S11 above).

[*S15 cont] (2) there is a significant probability that the owl will not survive the near-term transition from today's distribution of suitable habitat to the ISC's projected future landscape with its natural viability intact, TR at 61-62 (Orians); SAS Exh. 3 at 12 (Doak) & TR at 183-185 (Doak);

Reply - This issue is addressed in the response to the first comment on page L-A-35 of the FEIS which states: "The ISC Strategy was given an overall viability rating of HIGH in both the ISC Report and this EIS with recognition that habitat will decrease in the short term. The ISC Strategy was rated as providing a VERY HIGH probability of sustaining spotted owl populations for at least 50 years (Thomas et al. 1990: 39). The ISC Strategy provides for a pattern and distribution of habitat to minimize risk to the spotted owl.

"The standards and guidelines of the ISC Strategy, such as those for designated areas and dispersal habitat, are designed to provide for a viable population of northern spotted owls. An example of how the ISC Strategy accounts for particular areas is that in areas of concern, Category 1 or 2 HCAs are delineated, and in some areas, Category 3 HCAs are required. The EIS viability analysis for this environmental impact statement recognized that there is an expected loss of habitat at year 50, but after review of the entire Strategy, Alternative B was given an overall viability rating of HIGH." Further information is contained in the response to the first comment on page L-A-34 (see reply to *S10 above).

[*S15 cont] and, (3) there is little chance that the coordinated interagency effort necessary to fully implement the ISC plan, in either the short-term or over the extended period required for its realization, will materialize.

Reply - This issue was addressed in the response to the last comment on page on L-A-23 of the FEIS which states: "A detailed description of the interagency coordination required to successfully accomplish all aspects of the strategy is described in this environmental impact statement in Chapter 2. However, the full implementation of the ISC Strategy by all agencies is not necessarily required. In fact, the viability analysis in this EIS assumed [only that] other agencies would comply with the Endangered Species Act."

Additionally, the response to the second comment on page L-A-1 states in part: "This environmental impact statement uses the assumption that other lands will be managed in accordance with Section 7(a) or Section 10 of the Endangered Species Act. Specifically, it is assumed that as a result of consultation with the U.S. Fish and Wildlife Service other Federal agencies will manage their lands with a level and pattern of owl habitat protection necessary to meet the requirements of the Endangered Species Act and comparable to that presented in the ISC Strategy. This assumption is based on the record of consultation and opinions issued by the U.S. Fish and Wildlife Service in the last two years and on compliance by other agencies.

"The other Federal land management agencies have managed their lands in accordance with the opinions of the U.S. Fish and Wildlife Service and in accordance with the Endangered Species Act. It is true that the Bureau of Land Management in Oregon, after receiving "jeopardy opinions" on 44 proposed timber sales, applied for an exemption from the requirements of the Endangered Species Act under the Act's provisions of Section 7(g). The Endangered Species Committee has yet to rule on this application. A decision is expected in the first half of 1992. The Bureau of Land Management has not made any irreversible or irretrievable commitments of resources which would foreclose management of the habitat in accordance with the U.S. Fish and Wildlife Service's recommendations."

[*S15 cont] Nor is there any indication that this effort has occurred so far. TR at 79 (Orians); TR 1003 (Thomas); TR 837 (Forsman); Noon Dep. Tr. at 132.⁶

Reply - The interagency Technical Review Team was established, and has provided answers to technical questions, as was specified in the ISC Strategy.

[*S16] a. The ISC's projected future landscape poses a significant risk to the owl's viability.

Reply - This issue was addressed in the response to the first comment on page L-A-35 in the FEIS and included in the reply to *S15 above, and in the response to the last comment on page L-A-34 of the FEIS and included in the reply to *S10 above.

[*S17] The future distribution of the owl's habitat, as envisioned by the ISC, poses a significant risk to the owl's viability as a species because some of the key assumptions underlying the ISC's projection that its strategy will be adequate are very optimistic and are likely to provide too rosy a projection of the plan's potential success. TR at 62-68 (Orians); SAS Exh. 3 at 7-10 (Doak). The DEIS ignores completely these optimistic assumptions.

Reply - The scientific credibility of the ISC has been well established; see reply to the first comment on page L-A-23 of the FEIS and included in the reply to *S2 above. Additionally, projections of future habitat were recalculated for the FEIS using methods described in Appendix B of the FEIS (pages B-12-14). The assumptions for these projections are provided in Appendix B. Further, an inventory and monitoring plan is required as an integral part of the strategy to facilitate examination of assumptions (ISC Report 36-37 and 345-364; FEIS J-1-3, and; FEIS 2-33-34).

[*S18] The assumptions include a projection that juvenile owls will thoroughly search for suitable habitat to settle and breed in within the HCA where they are born before they attempt to disperse to other areas. TR at 62 (Orians); SAS Exh. 1 at 254. This assumption, as Dr. Orians testified in the SAS case,

"is questionable because the data that are so far available from dispersing juvenile owls does not provide any evidence that they search preferentially close to where they were born, but that they set off in approximately random directions and go substantial distances."

Reply - This issue was addressed in the response to the first comment on page L-A-24 of the FEIS and included in the reply to *S5 above. Further, it is because of the scientific data on dispersing juveniles that HCA's were spaced, and that dispersal habitat (the 50-11-40 rule) management guidelines were devised (ISC Report 303-314). Further, part of the rationale for providing designated areas large enough to support 20 or more pairs was to increase the likelihood of successful dispersal of juveniles. The analysis of nearest-neighbor distances included estimates of 2nd and 3rd nearest neighbors precisely because juvenile owls may indeed disperse in random directions from their natal range. When several neighboring areas are close together, the probability is greater that a dispersing juvenile will "blunder" into one of them.

[*S19] TR at 64. Moreover, as Dr. Orians also stated, it is "a very optimistic assumption because it makes the viability [of the owl] look much more certain than it would be if the individual juvenile owls continued to disperse more or less randomly." Id. Both Dr. Doak and Dr. Karevia corroborated Dr. Orians' testimony. SAS Exh. 3 at 8 (Doak); TR at 1208-1209 (Karevia).

Reply - This issue was addressed in the response to the first comment on page L-A-24 in the FEIS and included in the reply to *S5 above, and also in the reply to *S17 above.

[*S20] Neither the fact that there have been some anecdotal observations of owl's settling near where they were born, TR at 765 (Verner), nor the fact that data on juvenile dispersal reported in the ISC strategy shows some juvenile owls dispersing a relatively short distance, SAS Exh. 1 at 306 (Table P2), nor the fact that some studies show dispersing owls selecting more suitable habitat for roosting and foraging during dispersal, negates the fact that the ISC's projections of success for its strategy are based on the very optimistic assumption that juvenile owls will thoroughly search the habitat cluster where they are born before dispersing in directions that take them out of their home cluster. TR at 1209-1210 (Karevia).

Reply - If adequate dispersal habitat is indeed provided as ISC and this EIS call for, then the sequence of searching for habitat by juvenile spotted owls should not matter. This assumes that dispersing juveniles, and moving adults, have survival rates as estimated in the ISC analyses (ISC Report, Appendix L, pages 229-238; FEIS 3&4-35). Current survival rates are based on scientific field data, and future rates are assumed. Additional data will come from monitoring and ongoing owl population studies.

The arguments presented in this letter (primarily *S18 through *S24) assume that ISC and EIS revolved solely and fundamentally around a demographic simulation model. This is contradicted by text in the ISC Report that models were used to complement other empirical assessments and professional knowledge and to inform and aid decision-making. The text of the ISC Report on page 239-240 states: "Clarifying the role that computer simulation models, and the inferences drawn from them, played in developing our conservation plan is important. Their role was secondary. Our primary guidance derived from the results of empirical studies of the spotted owl's ecology and life history. The models provided one means of synthesizing this information and suggested

aspects of the animal's life history and behavior that may most affect its long-term population dynamics. We sought confirmation of model results from empirical studies of the spotted owl or other vertebrate species, and from the predictions of theoretical models (see discussion in appendices N, O, and P). A necessary caution is that the quantitative results of our models should only be interpreted as general qualitative guidelines; they should not be interpreted literally. We have used insights provided by our models as a way of ranking, from most to least important, the many factors that influence the species' population dynamics. Our models, like most, are also a great simplification of all the factors that influence the dynamics of "real" spotted owls."

Further, the Questions and Answers on A Conservation Strategy for the Northern Spotted Owl published in February 1991, Q&A #36, states in part: "Note that no decisions in the ISC strategy were based on models alone. Each decision point (hypothesis) was tested by applicable theory, empirical data, and a model. The use of models was only one tool used at each decision point."

[*S21] The anecdotal evidence and the dispersal data simply fail to address the only relevant question, which is: what fraction of juvenile owls actually settle and breed within a short distance of where they were born? TR at 1212 (Karevia).

Reply - It is debatable, and not clear, why this is "the only relevant question". Dispersal of owls within HCA's and throughout the Forest Matrix, as well as demographic stability of reproductive owls within HCA's, are some of the other "relevant questions" appropriate here. However, the question of breeding fates of juvenile owls is a very good one as it is central to ensuring fitness of the individuals and persistence of the population, which are basic ecological ideas addressed in the ISC and EIS. Note that the EIS acknowledged it cannot directly analyze the main parameters of population viability, but instead used indexes to such parameters (FEIS 3&4-47).

[*S22] The ISC projections of success for its strategy assume that more than 90% of dispersing owls will disperse and settle within their home cluster. TR at 1209 (Karevia). Current data do not support this optimism. TR at 1210 (Karevia). This optimism, however, means that the ISC strategy will pose greater risks to the owl than its drafters have acknowledged.

Reply - Continued monitoring and research will help ascertain where owls disperse and to what degree populations are at risk. The ISC accounts for this by requiring an extensive monitoring and research plan (see Appendix R of the ISC Report). For further information see Appendix J of the FEIS.

[*S23] The ISC's projections of future success for its strategy also are based on analysis of a landscape that has no edges making it impossible for owls to disperse away from an area that contain clusters of suitable habitat. TR at 65 (Orians); SAS Exh. 1 at 255; Exh. 3 at 9 (Doak); TR at 1194-1196 (Karevia).

Reply - The "ISC's projects of future success" was based on many factors such as multiple evaluations of demographic data, populations projections, habitat distribution, past and potential future habitat loss and growth rates, and

known owl distributions. The characterization that it was based fundamentally on one model is inaccurate. The fourth paragraph on page 239 of the ISC Report, which is included in the reply to *S20 above, clarifies the role of models on the ISC strategy.

[*S23 cont] Neither genetic selection for owls that do not disperse randomly or in unsuitable directions, TR at 770 (Verner), nor the suggestion that owls are unlikely to disperse in obviously wrong directions such as over the Pacific Ocean, TR at 958 (Boyce), address the problem that the future landscape inhabited by owls will have edges and owls will disperse away from areas of suitable habitat into areas such as the Puget Sound lowlands and the Willamette Valley where they are likely to perish. TR at 65 (Orians); SAS Exh. 3 at 9 (Doak); TR at 1195 (Kareiva). Thus, projecting the owl's future based on an assumption of a landscape with no edges is optimistic and leads to projections of the strategy's future success that are more favorable for the owl than is likely to be the case. TR at 65 (Orians); SAS Exh. 3 at 9 (Doak).

Reply - The ISC did assume that there was a wraparound landscape (ISC Report 255). This is an optimistic, but reasonable, assumption. It is possible that some birds will perish when they cross edges. There is not sufficient information to fully document how birds respond to such edges. However, there is also insufficient information to conclude that the given assumptions about edge are so optimistic as to lead to failure of the ISC strategy. It is important to note the roles that models played for the ISC. The results of models were not the decision factors. Their role was secondary (ISC Report p.239). The fourth paragraph on page 239 of the ISC Report, which is included in the reply to *S20 above, clarifies the role of models on the ISC strategy.

Further, monitoring and research will provide the insight needed as stated in the second paragraph of the response to the last comment on page L-A- 34 and included in the reply to *S10 above.

[*S24] In addition, the ISC's projections of the future success of its strategy are based on an analysis that assumes all clusters of suitable owl habitat are circular. TR at 66 (Orians); SAS Exh. 1 at 253. In fact, none of the HCAs are circular. Most are very irregular in shape. SAS Exh. 1 (Maps).

Reply - "Projections of future success" is non-specific; the risk assessment chapter in the ISC Report was not based solely on a model. This issue was also addressed in the reponse to the third comment on page L-A-35 which states: "The model used circular HCAs and assumed 15 pair occupancy. Since HCAs only approximate circles and a 25% percent vacancy of HCAs was expected, most of the Category 1 HCAs were made large enough to hold a minimum of 20 owl pairs where adequate amounts of habitat existed. The capacity of the HCAs compensates for the fact that they are not circular. A more detailed explanation of how the models were used and tested is in the ISC Report, Appendices M and Q."

[*S24 cont] As a consequence of these irregularly shaped HCAs, owls are much more likely to disperse outside of a suitable habitat cluster, and less likely to encounter an adjacent cluster, than the ISC projections indicate. Tr at 66 (Orians); SAS Exh. 3 at 9 (Doak). The assumption of circular habitat conservation areas thus leads to more optimistic

projections of the owl's future viability than is likely to be the case. TR at 66-67 (Orians); Noon Dep. Tr. at 57.

Reply - There is some degree of risk, and that is recognized and disclosed in the definitions of the viability ratings (3&4-93). The inventory and monitoring program is designed to examine the assumptions (FEIS, Appendix J, and ISC Report, Appendix R). The results from the monitoring program would then be used in the adaptive management process if necessary.

[*S25] Taken together, these optimistic assumptions caution that the ISC's eventual plan for the owl may not provide for large enough HCAs that are sufficiently close together to assure that birth rates at least equal death rates, and thus assure a viable, stable population. TR at 85 (Orians); SAS Exh. 3 at 17 (Doak).

Reply - There is some degree of risk, and that is recognized and disclosed in the definitions of the viability ratings (3&4-93). However, no strategy, including preservation of all remaining habitat can guarantee survival. Future events can only be discussed in terms of probabilities. Therefore the monitoring and research program is an essential part of the strategy (FEIS, Appendix J, and ISC Report, Appendix R). The ISC acknowledged that the best strategy, in terms of minimizing risk to the owl, is to preserve all existing habitat (Questions and Answers on A Conservation Strategy for the Northern Spotted Owl, published February 1991, Q&A #16). This issue is addressed in the response to the first comment on page L-A-24 and is also included in the reply to *S5 above.

[*S26] The DEIS fails to examine these issues altogether. The DEIS fails to caution the decision-maker and the public that the preferred alternative (the ISC Plan) is predicated on assumptions that are known to be optimistic.

Reply - The ISC Report specifically addresses issues of scientific uncertainty of data, confidence ranges of data analyses, and needs for more research information. "Known to be optimistic" is an unsubstantiated allegation without sufficient specificity to require a response. Optimistic is not defined or explained in the comment. Further discussion of incomplete and unavailable information is in DEIS and FEIS Chapters 3&4-1, Incomplete and unavailable information and the issue of optimistic assumptions has been discussed in the response to the first comment on page L-A-24 of the FEIS and included in the reply to *S5, as well as the response to the comment on page L-A-6 of the FEIS and included in the reply to *S7 above.

[*S27] b. The transition to the ISC's projected future landscape poses a significant risk to the owl's viability.

Reply - See the replies to *S28 through *S37 below.

[*S28] The preferred alternative also poses a significant risk to the owl's viability as a species because during the next several decades while the landscape envisioned by the ISC is created, the owl will continue to lose significant amounts of currently suitable habitat outside HCAs. The ISC itself has projected the loss of as much as 50-60% of the owl's current population during this transition period. SAS Exh. 1 at 35. The owl

simply may not survive this loss of population and habitat with enough resilience to reach a new stable population equilibrium in the future when the ISC strategy is fully implemented and the owl's habitat is regrown as envisioned. TR at 69-70, 74 (Orians).

Reply - ISC concluded that the risk is not so great as to warrant preservation of all existing habitat. However, the risk is great enough to monitor and research population responses and to revisit the management guidelines accordingly. This issue is addressed in the response to the first comment on page L-A-34 which states: "Under any alternative spotted owl numbers will decline in the short term. The ISC Report views the above referenced 50 percent decline as a worst-case scenario that assumes no owls will occur in the Forest Matrix between HCAs. This EIS accounts for owls in the Forest Matrix. An assumption of the ISC Strategy is that the overall number of spotted owl pairs is less important than the distribution of pairs (size of spotted owl clusters and distances between them). The ISC Strategy (Alternative B) results in a reduced population when compared to present levels, but a much more secure population due to size, spacing, and security of habitat. The habitat capability calculations in this EIS estimate a 26 percent decline from current habitat capability levels under Alternative B. The arrangement of habitat in large blocks that are adequately spaced compensates for a smaller population."

This issue is also addressed in the response to the first comment on page L-A-35 and is included in the reply to *S15 above.

[*S29] In any event, the ISC Report and the DEIS itself provide no analysis that reveals the basis on which the Forest Service proposed that the owl could survive this transition period. SAS Exh. 3 at 13-16 (Doak); TR at 70-72 (Orians). In fact, the DEIS does not even address the transition period issue. There are, however, significant but unanalyzed risks to the owls [sic] viability during this period of continuing habitat loss.

Reply - The "transition period" was addressed by viability criteria number one of the EIS that charted habitat amounts in 50-year increments out to year 150. The ISC Committee understood the near-term demographic "bottleneck" effect, however, and considered it in its evaluations and its identification of monitoring and research needs (ISC Report, Appendix R and T). Further, this issue is addressed in the replies to *S24 and *S28 above.

[*S30] First, the rate of suitable habitat logging under the ISC plan outside the protected HCAs is likely to substantially exceed the rate of regrowth of habitat within the HCAs. TR at 70 (Orians).

Reply - This is true for at least the first 50-year period and is graphed in criterion one of the EIS viability criteria. This issue is addressed in the response to the third comment on page L-A-33 (see reply to *S11 above).

[*S30 cont] Because no one currently knows how much habitat the owl can afford to lose before it crosses a population viability threshold we do not know whether the continued net loss of suitable habitat for an undetermined period will push the owl past a threshold point in some or all of its range. SAS Exh. 3 at 13-14 (Doak).

Reply - There is a recognized level of risk in this management plan, so there is validity to this statement. However, it is unlikely that there is specific level or amount of habitat that can be equated with a threshold. The assessment of risk is best equated to a gradient rather than trying to identify a single point that equates to a threshold. This issue was addressed in the response to the last comment on page L-A-34 in the FEIS and included in the reply to *S10 above, in the response to the first comment on page L-A-35 of the FEIS and included in the reply to *S15 above, and in the reply to *S13 above.

[*S31] We do, however, know that these population viability thresholds, in terms of suitable habitat remaining, exist. SAS Exh. 1 at 22; TR at 45-48, 51, 53-55 (Orians); Noon Dep Tr. at 75-76. We also know that at least some portions of the owl's population are showing demographic signs of being at, near, or past such a threshold. SAS Exh. 1 at App. L; Noon Dep. Tr. at 79-80; SAS Exh. 3 at 12-13 (Doak). In addition, we know that members of the ISC regard as crucial research to determine the rate of net habitat loss. Noon Dep. Tr. at 46-47. Finally, we know that for long-lived species such as the owl, it takes years for the population effects of habitat loss today to express itself. Indeed, as the ISC has acknowledged:

[*S32] Because of [these] lag effects, especially for species such as the spotted owl that have a long life span, certain processes leading to extinction may not be expressed in experimental results for decades. Meanwhile habitat conditions could deteriorate to the point that some critical threshold is passed and the extinction of the species is assured. SAS Exh. 1 at 145; see also TR at 58-59 (Orians); SAS Exh. 3 at 13 (Doak).

Reply - This was addressed in the reply to *S30 above. Again, the current scientific view is that of a gradient of risk or, conversely, assurance, that the populations will continue to persist well-distributed throughout their range. Models depicting specific threshold were considered by ISC, and deemed too simplistic and unrealistic to be interpreted literally (ISC Report, p240). In fact, Doak made a personal presentation to ISC on his model (ISC Report, p134). Further clarification appears in the response to the first comment on page L-A-35 and included in the reply to *S15 above, and in the response to the last comment on page L-A-34 of the FEIS and included in the reply to *S10 above.

[*S33] Neither the ISC Report nor the DEIS provide any analysis to show that, despite these habitat thresholds, current demographic signs of population danger, and lack of information regarding the rate of net habitat loss over the coming years and lag effects, the owl can continue to lose its existing suitable habitat without also losing its population viability. SAS Exh. 3 at 13-16 (Doak); see also Noon Dep. Tr. at 42-47.

Reply - This issue is addressed in the reply to *S31 above and clarification is provided in the response to the first comment on page L-A-35 of the FEIS and quoted in the reply to *S15 above.

[*S34] Indeed, the DEIS does not even address this issue, while the only analysis that any member of the ISC has identified (certain graphs in Appendix M of the Report, Noon Dep. Tr. at 42-43), are based on assumptions about juvenile spotted owl survival in the future that have no support in

fact today. SAS Exhs. 3 at 14-16 and 6 (illustrative graph); TR at 255-260 (Doak).

Reply - The risk of falling below a habitat threshold is minimized by the patterning of habitat in large blocks space closely enough to facilitate dispersal. Further, the issue of optimistic assumption has previously been addressed and is presented in the reply to *S5 above.

[*S34 cont] This absence of analysis of a crucial environmental risk is fatal to the DEIS. See e.g., Friends of the Earth v. Hall, 693 F. Supp at 936-938.

Reply - This was addressed. The EIS does present a risk analysis. See the response to the third comment on page L-A-5 of the FEIS which is included in the reply to *S2 above.

[*S35] A second source of serious risk to the owl during the transition period arises from the fact that the HCAs the Forest Service proposes to protect under the ISC plan currently average only 40 to 60 per cent suitable habitat, TR at 74 (Orians); SAS Exh. A-61. Although these HCAs contain many pairs of spotted owls today (more than 20 estimated pairs in many cases, Exh. 1 at 328-342) the ISC report does not present any analysis to show that these HCAs are currently functioning as clustered stable subpopulations of owls. TR at 162 (Orians); TR at 1200-1210 (Kareiva). Nor can one conclude from the presence of owls today in an HCA that the HCA is functioning as the kind of stable subpopulation that the ISC envisioned. TR at 1200-1202 (Kareiva). A "snapshot" of owl distributions today simply provides no evidence of population trends or vital rates (births, deaths, juvenile survival, etc) that would allow an assessment of how the HCAs are performing today. TR at 1200-1201 (Kareiva).

Reply - "Clustered stable subpopulations" is not defined in this comment. If it means that each HCA is an isolated (or acts as an isolated) set of owls whose birth rate is at least as great as its death rate, then this is not what ISC or EIS assumed. Rather, they assumed that HCAs will contribute to overall population stability as long as they are interconnected with adequate dispersal habitat. The HCAs act as "nodes in a metapopulation," not as isolated populations per se (ISC Report p286, and FEIS 3&4 73-74). Further clarification is provided in the response to the second comment on page L-A-34 in the FEIS which states: "In the viability analysis, owls were assumed to be currently interacting with other owls within and outside of the HCAs. Therefore, the viability analysis assumes that, since all spotted owls are interacting, HCAs are not functioning as discrete clusters at the present time. In the future, as habitat in HCAs increases and habitat in the Forest Matrix decreases, they will begin to function as discrete clusters."

[*S36] There are, however, a number of reasons why the HCAs today are unlikely to be providing the kind of population stability the ISC envisions. First, the HCAs today contain substantially less suitable habitat than they will in the future when habitat has had time to regrow. TR at 70-74 (Orians); SAS Exh. A-61. Thus dispersal success and survival for juveniles within the HCAs is likely to be much lower now and in the near future than the already optimistic projections in the ISC Report. SAS Exh. 3 at 14-16. Second, the occupancy by spotted owl pairs of those HCAs

that now contain 10 or fewer pairs is likely to be quite variable and unstable. Noon Dep. Tr. at 25. Finally, the ISC's own analysis shows that occupancy of habitat clusters of even 20 pairs does not stabilize until more than 60 percent of the habitat sites in the cluster are suitable. SAS Exh. 1 at 258; TR at 1212 (Kareiva). This conclusion provides a basis for the inference that even large HCAs today are not likely to be stable. TR at 121 (Kareiva).

Reply - The issue that some of the assumptions used in the ISC Strategy were too optimistic is included in the reply to *S5. Some of the assumptions used in the modeling effort may be too optimistic, however it is imperative to keep this issue in perspective. First and foremost, modeling was not the basis for the development of the ISC Strategy. "Models were used to determine if the evidence, common sense, and the theory made sense when rigorously examined in combination" (Questions and Answers on A Conservation Strategy for the Northern Spotted Owl, published in February 1991, part of Q&A #39). "Note that no decisions in the ISC Strategy were based on models alone. Each decision point (hypothesis) was tested by applicable theory, empirical data, and a model. The use of models was only one tool used at each decision point" (Ibid, Q&A #36).

The ISC Strategy incorporated a monitoring and research plan to test the assumptions upon which the strategy is based. If additional research or monitoring results indicate that assumptions should be modified, and thus a change in the management strategy is required, then this can be accomplished through the adaptive management approach. Adaptive management is a part of the ISC Strategy.

[*S37] There is, then, a significant risk that the network of HCAs that are proposed by the DEIS pursuant to the ISC plan will not maintain the owl's population viability over the next two to ten decades while the ISC plan becomes fully implemented. The DEIS does not even hint at this risk.

Reply - There is a degree of risk. The ISC concluded that it is not "significant" to the degree that the conservation strategy will likely result in extirpation or declines of the populations within HCAs. Paragraphs *S35 to *S37 do not take into account that dispersal habitat is a key component of the ISC Strategy. Dispersal habitat is key because it helps ensure mutual demographic rescue among HCAs by owls from nearby HCAs. The HCAs are not and never were intended to be individually self-sustaining.

[*S38] c. The absence of a coordinated administrative plan for fully implementing the ISC Strategy also poses an immediate and significant risk to the owl's continued viability.

Reply - This issue was addressed in the response to the last comment on page L-A-23 of the FEIS which states: "A detailed description of the interagency coordination required to successfully accomplish all aspects of the strategy is described in this environmental impact statement in Chapter 2. However, the full implementation of the ISC Strategy by all agencies is not necessarily required. In fact, the viability analysis in this EIS assumed only that other agencies would comply with the Endangered Species Act." Further, the issue of viability and management of other lands is addressed in the responses to both comments on page L-A-1 of the FEIS which state: "The Forest Service has no jurisdiction to direct the management of lands other than those, such as

National Forests, National Grasslands, and some National Monuments, that are specifically assigned to the Agency by Law or Executive Order", and;

"How other land managers manage spotted owl habitat is important but not within the Forest Service's jurisdiction. In assessing viability it is assumed that other Federal land managers will comply with Section 7(a), and private and other landowners will comply with Section 10, of the Endangered Species Act.

"The northern spotted owl is listed as a Threatened subspecies; the effect of the management direction presented in these alternatives on the viability of the entire subspecies is of concern to the public and the Forest Service. Therefore, the viability analysis in this FEIS assesses the effect of the alternatives (which provide management direction for National Forests lands only) on the long-term viability of the northern spotted owl as a subspecies in the planning area.

"This viability analysis of the subspecies is appropriate because 1) the viability of populations outside the National Forests contribute significantly to a well distributed viable population in the National Forests, 2) the CEQ regulations implementing NEPA Section 102 (40 CFR 1508.23(a)(2), 1508.25(c) and 1508.7) require the analysis and disclosure of consequences outside the immediate site or planning area, and 3) the Endangered Species Act (Section 7(c)(1)) requires a biological assessment to identify the effects of an action on a Threatened, Endangered, or Proposed Species. (The biological assessment may be undertaken, as it was in this case, as part of the environmental impact statement.)

"The U.S. Fish and Wildlife Service, under the authority of Section 7(a) of the Endangered Species Act, is responsible for evaluating whether or not a threatened species is jeopardized by another Federal agency and that its critical habitat is not destroyed or adversely modified. That responsibility is the basis for assessing the effect of the alternatives in this FEIS on the viability of the northern spotted owl.

"This environmental impact statement uses the assumption that other lands will be managed in accordance with Section 7(a) or Section 10 of the Endangered Species Act. Specifically, it is assumed that as a result of consultation with the U.S. Fish and Wildlife Service other Federal agencies will manage their lands with a level and pattern of owl habitat protection necessary to meet the requirements of the Endangered Species Act and comparable to that presented in the ISC Strategy. This assumption is based on the record of consultation and opinions issued by the U.S. Fish and Wildlife Service in the last two years and on compliance by other agencies.

"The other Federal land management agencies have managed their lands in accordance with the opinions of the U. S. Fish and Wildlife Service and in accordance with the Endangered Species Act. It is true that the Bureau of Land Management in Oregon, after receiving "jeopardy opinions" on 44 proposed timber sales, applied for an exemption from the requirements of the Endangered Species Act under the Act's provisions of Section 7(g). The Endangered Species Committee has yet to rule on this application. A decision is expected in the first half of 1992. The Bureau of Land Management has not made any irreversible or irretrievable commitments of resources which would foreclose

management of the habitat in accordance with the U. S. Fish and Wildlife Service's recommendations.

"Should the Endangered Species Committee grant an exemption to the Bureau of Land Management and the spotted owl habitat on the lands it manages is adversely modified, this new information would be a cause for reexamining the effects on the viability of the spotted owl as a subspecies and reexamining the management direction for its habitat on the National Forests.

"Where the management of owl habitat by other managers is especially crucial to the viability of the northern spotted owl, it is identified in the environmental impact statement, along with the consequences should those management assumptions not be met."

For further information, see the FEIS, pgs. 3&4 51-52.

[*S39] There is not currently in place a coordinated administrative plan to fully implement the ISC conservation strategy for the spotted owl. Noon Dep. Tr. at 132-133; TR at 1003 (Thomas); TR at 837 (Forsman). Yet the ISC itself identified the absence of such a coordinated administrative effort as one of the most significant threats to the owl's continued survival. SAS Exh. 1 at 18; Noon Dep Tr. at 132-133.

Reply - This issue is addressed in the responses to both comments on page L-A-1 of the FEIS and included in the reply to *S38 above.

[*S40] Partial and uncoordinated implementation of the ISC plan presents a substantial and unanalyzed risk to the owl. Nor will the actions of the U.S. Fish and Wildlife Service under the Endangered Species Act necessarily address or remove these risks. First, the FWS' duties towards the owl arise under a separate statutory scheme from those of the Forest Service. Second, it is presently unknown what actions the FWS will take to protect the owl either through the eventual designation of critical habitat or through other procedures under the Endangered Species Act.

Reply - This issue is addressed in the responses to both comments on page L-A-1 of the FEIS and included in the reply to *S38 above. Further, the U.S. Fish and Wildlife Service has issued a final rule to designate critical habitat. The criteria used to identify critical habitat were based on the principles of the ISC Strategy (Fed. Reg., Vol. 57, No. 10, January 15, 1992: p.1803).

[*S41] There also is not in place a monitoring program to provide data and feedback for assessing whether and how well the ISC plan is working, Noon Dep. Tr. at 48-49,

Reply - The Forest Service has had a monitoring program in place since 1987. Annual reports of results are available from each Regional Office.

Further clarification was presented in the response to the third comment on page L-A-42 of the FEIS, "This environmental impact statement outlines a monitoring strategy (see Appendix J). The ISC Report also includes a monitoring plan in Appendix R. The spotted owl Research, Development and Application Program will oversee development of a monitoring plan."

[*S41 cont] although such a program of monitoring is an essential part of the ISC plan, id. at 49; SAS Exh. 1 at App. R,

Reply - We agree. Both the ISC and the EIS also said this, and both presented a framework for research and monitoring plans.

[*S41 cont] and the ISC would not have recommended adoption of its plan without this monitoring, Noon Dep Tr. at 52.

Reply - This issue is addressed in the response to the third comment on page L-A-42 and included in the reply to *S41 above.

[*S41 cont] Indeed, members of the ISC certainly expected that the monitoring program necessary to full implementation of the plan would be in place. Noon Dep. Tr. at 119-120.

Reply - ISC Report did indeed state the necessity of, and presented a framework for, a monitoring plan (ISC Report, p.36 and Appendix R, p.345-364).

[*S41 cont] Nor does the DEIS cure the problem by proposing a monitoring program; in fact, monitoring is not even discussed in the DEIS.

Reply - A discussion of monitoring in the ISC Report was incorporated by reference. Further, see Appendix J of the FEIS, Monitoring Plan.

[*S42] Without an appropriate program of monitoring it is impossible to determine the degree to which the risks of the ISC plan have materialized. Yet this avoidable lack of information itself increases a significant risk to the owl because we will not have the early warning signals of a problem or failure that monitoring could provide.

Reply - This issue is addressed in the response to the third comment on page L-A-42 and included in the reply to *S41 above.

[*S43] B. The DEIS Does Not Disclose or Respond to Criticism of the Forest Service's Proposed Plan.

Reply - See response to *S44 through *S48 below.

[*S44] The Forest Service's complete failure to provide any meaningful assessment of the risks and uncertainty that attend its proposed owl habitat management plan -- the ISC strategy -- reflects, or is perhaps best explained by, another rudimentary flaw in the DEIS -- the agency's stubborn refusal to acknowledge or respond to the extensive and fundamental scientific criticisms of its owl management program.

Reply - It is unclear which "owl management program" is referred to here. Also, the "extensive and fundamental scientific criticisms" are unspecified. It is therefore impossible to provide a response to this comment. Further, this issue was also addressed in the reply to *S2.

[*S44 cont] Of course, both the case law, see, e.g. Silva v. Lynn, 482 F.2d at 1285, and CEQ NEPA regulations require the Forest Service to respond to its critics:

[*S45] The agency shall discuss at appropriate points in the final statement any responsible opposing view which was not adequately discussed in the draft statement and shall indicate the agency's response to the issues raised. 40 C.F.R. s 1502.9(b).

Reply - The Forest Service received six comments during the scoping period. One of the six responses was received from the plaintiffs and intervenors in the SAS v Evans case, although they were all specifically contacted to solicit their comments. Five thousand, two hundred thirty-one comments were received on the DEIS. These comments are responded to with revisions and refinements in the FEIS, as well as response to the comments in a 90 page section of Appendix L.

[*S46] The importance to the overall adequacy of an EIS of a full response to criticism has been confirmed in numerous judicial decisions. See e.g. Friends of the Earth v. Hall, 693 F. Supp. at 924-25, 931. Similarly, other courts have found impact statements inadequate where the agency preparing the EIS failed to acknowledge or respond to its critics. See, e.g. Sierra Club v. Corps of Engineers, 701 F.2d 1011, 1030-31 (2d Cir. 1983) (and cases cited therein); Citizens Against Toxic Sprays, Inc. v. Bergland, 428 F. Supp. 908, 922 (D. Ore. 1977). Indeed, where an EIS fails to acknowledge or respond to its critics, it is fatally flawed. See Friends of the Earth v. Hall, 693 F. Supp. at 924-25, 931.

Reply - See the response to *S45 above.

[*S47] The DEIS fails either to identify or respond to the large body of responsible scientific opinion challenging the accuracy of its assessment of the environmental consequences that will follow from continuing the harvest of spotted owl habitat under the ISC strategy. There is no attempt, for example, to explain why the Forest Service disagrees with Dr. Orian's criticisms of the ISC Plan, the DEIS' preferred alternative.⁸ Nor does the DEIS address the criticisms of Drs. Doak or Kareiva. Yet all of these unquestionably reputable comments on the Forest Service's proposed plan were available to the Forest Service well before it released the DEIS. The failure to respond to such criticism is fatal to the DEIS. See Friends of the Earth v. Hall, 693 F. Supp. 904, 924-25 (W.D. Wash. 1988); Citizens Against Toxic Sprays, Inc. v. Bergland, 428 F. Supp. 908, 922 (D. Ore. 1977).

Reply - It is unclear what "large body of responsible scientific opinion" refers to, the criticisms on the ISC strategy were mixed in that some contended that the ISC strategy was too protective of owls while others contended that the ISC strategy did not provide adequate protection of owls. The ISC went through a detailed process to establish scientific credibility, as stated in the response to the first comment on page L-A-23 of the FEIS and included in the reply to *S2 above.

The comments and concerns of Drs. Doaks, Kareiva, and Orians were specifically addressed by the ISC scientists during the evidentiary hearing of SAS vs Evans. A purpose of the EIS was not to specifically address individual criticisms but rather to consider all relevant information and to assess the viability of the owl under management alternatives. This was done in the EIS.

Further, the fundamental concepts were also addressed in the EIS; for example, concerns on thresholds and the use of models was addressed in the last response to the comment on page L-A-34 which is presented in reply to *S10.

[*S48] In sum, CEQ regulations demand a response to opposing views in order to allow an informed decision and a full public disclosure. In the absence of a response to such criticisms, the procedural requirements of NEPA are not met. Similarly, CEQ regulations require a meaningful evaluation of risk and uncertainty. Where, as here, none is provided, the DEIS is legally inadequate -- contrary to the basic purposes of NEPA, the Forest Service DEIS attempts both to sweep stubborn environmental problems under the rug and ignore serious criticism.

Reply - The Forest Service received a large number of specific comments on the DEIS, on the scientific credibility of the ISC Strategy, and on the scope of the alternatives. It responds to these in a 90 page section of Appendix L in the FEIS. In addition, the FEIS is responsive to a number of comments with a new alternative, a refined viability analysis, new employment effects, and other changes. This was an attempt to address criticism, incorporate ideas and improve the analysis.

The issue of risk and uncertainty was specifically addressed in the response on page L-A-6 of the FEIS (see reply to *S7 above).

[*S49] II. THE FOREST SERVICE OWL HABITAT MANAGEMENT PLAN VIOLATES THE NATIONAL FOREST MANAGEMENT ACT AND ITS IMPLEMENTING REGULATIONS

Reply - See response to *S50 through *S63 below.

[*S50] The National Forest Management Act (NFMA) instructs the Secretary of Agriculture to promulgate regulations for the management of national forests that will "provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple use objectives" 16 U.S.C. s 1604 (g)(3)(B). These regulations unambiguously state that:

[*S51] Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area. 36 C.F.R s 219.19. Pursuant to the same regulations, a viable population is defined as:

[*S52] one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area. Id.

Reply - This is a quotation; no response is appropriate.

[*S53] The Forest Service's proposal in the DEIS that its preferred alternative owl habitat management plan will meet these requirements is arbitrary and capricious. First, the agency's statements that its proposed

plan will protect the owl is based entirely on a flawed environmental disclosure.

Reply - We disagree with this characterization for the EIS. The replies to comments above have addressed this issue.

[*S53 cont] Reliance on such a defective analysis of environmental consequences renders the agency's conclusion of safety for the owl arbitrary as a matter of law. See Section A below. Second, the DEIS' "viability analysis" is not scientifically credible work; it is mere assertion. See Declaration of Dr. Peter Kareiva, attached hereto. Thus the proposed plan, which is justified on the basis of the DEIS' viability analysis, is illegal. See Section B below.

Reply - The EIS team and the ISC consulted with panels of scientists and spotted owl experts during the development of the criteria used to assess viability and for the rating of the alternatives. The viability analysis was refined between the DEIS and the FEIS. The proposed plan is not illegal.

[*S54] A. The Forest Service Cannot, as a Matter of Law, Rely on the Defective Analysis of the DEIS to Conclude that its Owl Management Plan Complies with the Requirements of the NFMA.

Reply - See responses to *S55 through *S58 below.

[*S55] Where an agency bases its conclusion that a project meets the requirements of substantive environmental laws on an inadequate EIS, the decision regarding compliance with the substantive law is necessarily arbitrary. See Friends of the Earth v. Hall, 693 F. Supp. at 945-47. In Hall, the court considered whether the Corps of Engineers had properly concluded that the proposed dredging project met the requirements of the federal Clean Water Act. The Court concluded that the Corps' approval of the project under the Clean Water Act was arbitrary because the Corps had based its decision on a defective EIS:

Reply - This comment does not lend itself to a specific response.

[*S56] Because the Corps' ROD relies on the EISs and the studies cited therein to conclude that the RADCAD project will not cause significant degradation, FOE contends that the Corps acted contrary to law and arbitrarily and capriciously Given the court's findings and conclusions with respect to FOE's NEPA challenge [that the Corps EIS is defective], the court must set aside as arbitrary and otherwise not in accordance with law the Corps' finding [under the Clean Water Act] that RADCAD would not result in any significant degradation. Id. at 945-46.

Reply - This comment does not lend itself to a specific response.

[*S57] Here, the Forest Service relies exclusively on the analysis in the DEIS to suggest that its proposed owl management plan will protect a viable, well-distributed population of owls as required by the NFMA and its implementing regulations. Yet, as SAS has shown, see supra, Sections I and II, the analysis in the DEIS is fundamentally and fatally flawed because it fails to address the risks and uncertainty of the Forest Service's proposed

owl management plan or respond to the serious criticisms of that plan. Where, as here, important considerations have been ignored in the EIS, the agency's conclusion regarding compliance with the NFMA based on that EIS is "without [an] underlying rational basis." Friends of the Earth v. Hall, 693 F. Supp. at 946.

Reply - Previous responses to these charges have noted that risks and uncertainties are addressed and serious criticism is responded to in the FEIS.

[*S58] This result, a finding that the Forest Service has arbitrarily proposed that its owl plan meets the requirements of the NFMA, is not only required as a matter of law, it makes perfect sense. An agency action would be arbitrary under the APA where the decision is not based on a consideration of the relevant factors or where the court finds that there has been a clear error of judgment. See Motor Vehicle Mfrs. Ass'n v. State Farm Mut., 463 U.S. 29, 43, 103 S. Ct. 2856, 2867 (1982). Where the DEIS that provides the agency's analysis and explanation for its proposed actions fails to meet one or more of the important procedural requirement of NEPA designed to insure a full disclosure of environmental consequences and a well-informed decision, it follows that the agency has not considered the relevant factors if it bases its subsequent decision on the defective EIS. Certainly, in this case, the Forest Service has failed to consider relevant factors by proposing, based on the DEIS, that its preferred owl management plan complies with the NFMA and its implementing regulations.

Reply - The Forest Service has considered all relevant factors in proposing an owl management plan that complies with NFMA and its regulations.

[*S59] B. The DEIS' "Viability Analysis" is Singarily Useless.

Reply - This critique of the viability analysis is that of the viability analysis presented in the DEIS. The viability analysis in the FEIS was refined with quantitative information on several of the criteria, and with an awareness of specific criticisms of the process.

[*S60] The DEIS includes a section titled "Population Viability," which is put forward as the agency's assessment of population viability for the four alternatives. DEIS at 3&4-33 to 76. When the jargon is swept aside, the DEIS' viability assessment is quite simple: if the alternative is at least as protective of the owl as the ISC plan, it receives a "high" viability ranking, while the alternative that is less protective than the ISC plan receives a "low" rank.

Reply - This happened to be the result and conclusion of the assessment, but was not the "rule" by which individual alternatives were to be rated. The DEIS described how, and by which criteria, the alternatives were rated.

[*S60 cont] Thus, for example, the DEIS' viability Criterion 4, "Dispersal," states that if the alternative provides for specific management of dispersal habitat, as the ISC plan does, the alternative ranks "high," but if no dispersal habitat is explicitly provided, the alternative ranks "low."

Reply - It was the combination of the outcome of all 7 viability criteria that contributed to rating the alternatives. The result of any one criterion did not in itself determine the rating. Further clarification is provided in the response to the third comment on page L-A-37 which states "Dispersal habitat was considered as one of the criteria used to assess viability, however, it was not the only factor considered. Although Alternative E has provisions for dispersal habitat within the Owl Management Zone it did not receive a HIGH viability rating."

[*S61] According to Dr. Kareiva, an expert in risk assessment for wildlife populations, the DEIS' viability analysis is not a credible analytical piece of work. See Declaration of Dr. Peter Kareiva. In fact, Dr. Kareiva notes that the DEIS' assessment bears a striking resemblance to the now-defunct and discredited SEIS.¹⁰

Reply - This issue is addressed in the replies to *S47 though *S60 above.

[*S62] Perhaps most mysterious is why the Forest Service failed to make use of the efforts of its own best experts in viability assessments, Drs. Noon and McKelvey, who have assessed the spotted owl's viability using the next generation of the analytical tool used by the ISC, which itself was based on the seminal theoretical work of Dr. Russell Lande. Drs. Noon and McKelvey are performing the viability analysis for the Forest Service's neighbor, the Bureau of Land Management, but the Service itself apparently wished to distance itself as much as possible from any rational analytical assessment of the owl's viability. In fact, the agency wrote to Dr. McKelvey to inform him that unless his analysis was subjected to an imposing validation exercise, the Forest Service would not consider it. Adm. Rec. at 138.

Reply - This issue was addressed in the DEIS and FEIS on 3&4-3 "New models are under development, most notably the spatially explicit population model of McKelvey (1991). However, this model has not received sufficient testing and review to warrant its use at this time to assess the alternatives presented in this environmental impact statement."

This issue is also addressed in the response to the first comment on page L-A-36 of the FEIS, "Testing of the model and preparation of the data for model input was not possible in the time available for preparation of this EIS. Both the McKelvey model and the viability analysis for this EIS examined the key fundamental parameters necessary to examine population viability. The McKelvey model (see Appendix D) is a simulation model using complex quantitative relationships and further testing of this model is needed.

"The viability analysis used in this EIS, Chapter 3&4, was developed and reviewed by spotted owl and population biology experts. The analysis incorporated tested concepts based on empirical data. The analysis took into account various aspects of population biology such as habitat requirements and dispersal capabilities.

"The criteria used in this EIS to assess viability are indices to key population parameters such as size, distribution, and trend. The viability analysis for this document focuses on the amount and distribution of nesting, roosting, and foraging habitat over time. The amount and distribution of

habitat are factors that are directly related to implementation of a management plan."

The McKelvey model lacked a database in the proper format and detail runs to sufficiently test the model at the time of the FEIS analysis. Note that further testing of the McKelvey model has been conducted since the preparation of the EIS. Significant numbers of runs and trials of the model have been done on the California owl project since the preparation of this FEIS.

[*S63] Ironically, the DEIS' own viability analysis was not the subject of any validation test or peer review. Kareiva Decl. at p 6, fn 2.

Reply - The EIS team consulted with panels of scientists and spotted owl experts to assess the viability of the owl, FEIS chapter 3 &4 - 94.

[*S63 cont] In fact, it is not even sufficiently documented to be fully understandable. Kareiva Decl. at p 12. It appears that the agency used a standard for dismissing Drs. Noon and McKelvey's work, which it refused to apply to its own unsupported assertions.

Reply - This issue is addressed response to the first comment on page L-A-36 of the FEIS and is included in the reply to *S62 above.

[*S63 cont] Here the Forest Service's effort to use a scientifically credible method of analysis renders any decision based on the DEIS necessarily arbitrary and capricious and a violation of the NFMA.

Reply - The Forest Service did use a scientifically credible method of analysis.

[*S64] III. THE NORTHERN SPOTTED OWL IS A NECESSARY BUT NOT SUFFICIENT MANAGEMENT INDICATOR SPECIES FOR THE OLD-GROWTH FOREST PLANT AND ANIMAL COMMUNITY

Reply - See responses *S65 through *S68 below.

[*S65] The NFMA regulations require the Forest Service to designate management indicator species

Reply - This issue is addressed in the response to the first comment on page L-A-64 which states: "As noted in responses in "The EIS Process" in this appendix, this proposed action is not focused on old-growth ecosystems. This document responds to these concerns in a number of ways. First, by identifying and protecting designated areas from management activities that would alter spotted owl habitat, other species dependent on late-successional and old-growth habitats would also be protected. Secondly, analysis at the Forest level, as part of Forest Plan implementation, will provide site specific assessment and application of Forest Plan standards and guidelines to protect all species in the planning area. A detailed disclosure of impacts to all species inhabiting northern spotted owl habitat is outside the scope of this EIS.

[*S65 cont] "[i]n order to estimate the effects of each alternative on fish and wildlife populations" and to "maintain viable populations of existing

native and desires non-native vertebrate species in the planning area." 36 C.F.R. § 219.19; Seattle Audubon Society v. Evans, Civ. No. C89-160WD (W.D. Wa, Order of March 7, 1991), slip op. at 12. The northern spotted owl is a management indicator species for the old-growth forest ecosystem within the owl's range. Thus the fundamental goal of the Forest Service's owl plan extends beyond preserving the owl's viability; the plan must also assure the viability of the other species whose viability depends upon the same community type, old-growth forests, that the owl requires. Id. ("The duty to maintain viable populations of existing vertebrate species requires planning for the entire biological community -- not for one species alone.").

Reply - This confusion over the purpose of the EIS was not uncommon. This issue is addressed in the response to the third comment on page L-A-4 of the FEIS which states: "In the Court's opinion of May 23, 1991, (SAS v Evans, 771 F.Supp. 1081 (W.D. Wa. 1991), slip op. Findings of Fact 20. and 21.), the Court, in establishing the schedule for this environmental impact statement, observed:

"20. The Forest Service now has advantages it lacked in early 1990. Much of the research and analysis has been done. The ISC Report, a thorough treatment, has been in existence for more than a year. The agency also has the benefit of an opinion letter from the FWS dated April 10, 1991, commenting at length on the ISC strategy and giving recommendations.

"21. With the knowledge at hand, there is no reason for the Forest Service to fail to develop quickly a plan to ensure the viability of the spotted owl in the national forests. Coordination with the FWS need not be an obstacle; the agencies have coordinated their efforts on other species, and can on this one.

"The Forest Service sees no instruction in Court's orders to prepare a plan for the management of old-growth forests. It sees its definition of the Proposed Action and the Purpose and Need statements in Chapter 1 as being fully responsive to the Court's instructions of May 23, 1991:

"A. The Forest Service is enjoined to proceed diligently in compliance with NFMA, as required by the order on April 1, 1991 (Dkt. #867), and to submit to the court and have in effect by March 5, 1992, revised standards and guidelines to ensure the northern spotted owl's viability, together with an environmental impact statement, as required by NFMA and its implementing regulations."

[*S66] The DEIS fails entirely to assess whether its proposed plan for maintaining the owl's viability also assures the viability of the companion species for which the owl is an indicator species. This flaw is particularly startling in light of the Scientific Panel on Late-Successional Forest Ecosystems report "Alternatives for Management of Late-Successional Forests of the Pacific Northwest" ("Old-Growth Panel Report"). This report, prepared by leading scientists from the Forest Service and elsewhere, concludes starkly:

"Alternative 4 (Forest Plans + ISC) provides . . . a medium-low to low probability of a functional LS/OG network and the habitat needs of other threatened or potentially threatened species. . . ."

Reply - This point is addressed in the Introduction to Management of Other Resources on page L-A-3 of the FEIS which states: "This environmental impact statement is narrowly focused on a management plan to ensure the viability of the northern spotted owl. Many reviewers who commented on the DEIS wanted the scope of this document broadened to consider the management of other forest resources. The FEIS continues with the same scope, proposed action, and purpose and need that were in the DEIS.

"This does not close the door on future consideration of the management for issues for old-growth, old-growth associated species, water quality, or fish stock viability. The land and resource management planning process set up by NFMA assures that such issues will be reconsidered at specified, periodic intervals, as well as when conditions indicate they should be examined or reexamined."

This point is also addressed in the response to the second comment on page L-A-4 of the FEIS which states: "Those alternatives which result in a high probability of the viability of the northern spotted owl, a management indicator species, also provide protection for other species associated with old-growth forests. Those consequences are disclosed in the environmental impact statement. However, as noted in several places in this environmental impact statement (Chapter 1. "The Proposed Action"; Chapter 2, "Alternatives Eliminated from Detailed Study"), the management of old-growth forests as distinct from old-growth habitat is outside the purpose and need of the proposed action."

Further this issue is addressed in the response to the first comment on page L-A-5 of the FEIS which states: "The Scientific Panel's estimates are presented in this environmental impact statement; see the Chapter 3&4 section on "Wildlife Species Associated with Late-Successional Forests". The Scientific Panel's Alternative 4 was based on the management of both the National Forests and BLM managed lands within the range of the northern spotted owl, using each agency's resource management plans plus the ISC Strategy." The National Forest's contribution to the overall viability to these species is not clear from their evaluation.

[*S67] The northern spotted owl has been designated an indicator species for old-growth ecosystems by the FS. As such, it is assumed that if the northern spotted owl continues to exist in viable numbers, all species associated with old growth will do likewise. The indicator-species concept has come under criticism, and our analysis confirms that criticism: management to assure the long-term viability of the northern spotted owl will not necessarily provide adequately for all other LS/OG-associated species. Old-Growth Panel Report at 7.

Reply - This issue is addressed in reply to S68 below.

[*S68] The Forest Service must address the concern raised by the Old-Growth Panel and consider whether its proposed plan for the owl will accomplish the underlying purpose of the NFMA -- the protection of the old-growth

forest ecosystem and all of its plant and animal residents. This duty is entirely consistent with, in fact, required by, the court's findings and order in the SAS case.

Reply - This issue is addressed in the response to the third comment on page L-A-4 of the FEIS and is also included in the reply to *S65 above, quoting the court order from SAS v. Evans.

It is also address in the response to the introduction to "Management of Other Resources" on page L-A-3: "This environmental impact statement is narrowly focused on a management plan to ensure the viability of the northern spotted owl. Many reviewers who commented on the DEIS wanted the scope of this document broadened to consider the management of other forest resources. The FEIS continues with the same scope, proposed action, and purpose and need that were in the DEIS.

This does not close the door on future consideration of the management for issues for old-growth, old-growth associated species, water quality, or fish stock viability. The land and resource management planning process set up by NFMA assures that such issues will be reconsidered at specified, periodic intervals, as well as when conditions indicate they should be examined or reexamined.

[*S69] CONCLUSION

For the foregoing reasons the Forest Service's DEIS should be revised substantially and the preferred alternative modified to assure the spotted owl's viability is preserved.

DATED: December 24, 1991

Reply - The preferred alternatives does insure viability; the DEIS has been revised in the FEIS by taking into account the comments and criticisms received during the EIS process.

Footnotes

¹ These organizations may be submitting additional comments under separate cover.

Reply - This footnote does not lend itself to a specific comment.

² 40 C.F.R. s 1502.22 provides, in relevant part:
If the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known, the agency shall include within the environmental impact statement: . . . (2) a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment; (3) a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment, and (4) the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. For purposes of this section, "reasonably foreseeable" includes impacts which have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.

Reply - A quotation, this footnote does not lend itself to a specific comment.

³ The fact that the Northwest Indian Cemetery Ass'n, SOCATS, and Hall cases were all decided under the precursor to the current uncertainty regulation does not affect the importance of disclosing uncertainty and assessing its foreseeable risks to compliance with NEPA procedures. As the CEQ noted when it amended the uncertainty regulation:

It must be emphasized that the Council concurs in the underlying goals of the original regulation -- that is, disclosure of the fact of incomplete or unavailable information; acquisition of that information if reasonably possible, and evaluation of reasonably foreseeable significant adverse impacts even in the absence of all information. These goals are based on sound public policy and early NEPA caselaw.

Purpose and Analysis of Final Amendment, 51 Fed. Reg. 15620 (1986)(footnote omitted); see also 49 Fed. Reg. 50744 (1984).

Reply - This footnote does not lend itself to a specific comment.

⁴ "TR" refers to the trial transcript and "SAS Exh." refers to the trial exhibits in the Seattle Audubon Society v. Evans ("SAS") case. All exhibits and testimony submitted by plaintiffs in that case are incorporated herein by reference. If the Forest Service requires copies of any of these documents, please let us know immediately and we will provide the requested material.

Reply - This footnote does not lend itself to a specific comment.

⁵ The ISC pointed out that:

We must consider that the success we anticipate for this conservation strategy may be too optimistic; it has yet to be tested. The future habitat conditions we visualize have never existed before. We face a rapidly decreasing ability to designate additional habitat for owls if the assumptions used to construct the proposed strategy prove deficient.

The DEIS, on the other hand, fails to even hint at the experimental nature of the ISC Plan. Of course, it is in the DEIS that the Forest Service must disclose risk and uncertainty; the Forest Service cannot meet NEPA's full-disclosure mandate by reference to secondary sources.

Reply - Under Alternative B, the amount of habitat decreases at a rate of .15 percent per year. This would not seem to equate to a "rapidly decreasing ability to designate additional habitat". See the response to the comment on page L-A-6 in the FEIS, which addresses the ways risk was disclosed in the EIS (see reply to *S7 above).

⁶ For example, not only has the Bureau of Land Management adopted the Jamison Strategy, which fails short of the ISC plan in its protection of the owl, but BLM has also petitioned the Endangered Species Committee to sell timber that, according to the Fish and Wildlife Service, would jeopardize the owl's continued survival. The ISC itself pointed out that

Less than full implementation of the strategy, as proposed, such as reducing the size or number of HCAs, or any changes in strategy implementation in portions of the owl's range, will substantially change the viability assessment and greatly reduce the likelihood of long-term northern spotted owl persistence.

ISC Plan at 387. The DEIS fails to make an assessment of the effect the BLM's failure to participate in the ISC Strategy will have on the Forest Service's predicted success of that Strategy.

Reply - The FEIS stated that, if BLM doesn't manage owl habitat as per the stated assumptions, then the viability analysis would have to be revisited, see 3&4-51 of the FEIS.

⁷ The DEIS projects owl habitat recruitment through time, but fails to explain or justify the predicted recruitment rates, nor does the administrative record provide any explanation. An IDT spokesperson reported that each national forest used its own methodology to project habitat recruitment, but the IDT does not itself know what methods were used.

Reply - It is unclear what "explain or justify" and "explanation" mean. Growth of habitat was indeed accounted for in the DEIS and was defined as growth of

young forests from unsuitable owl habitat conditions into older forests suitable for owls. It is true, though, that the DEIS did not annotate the specific models and criteria each National Forest used to calculate such growth rates and amounts. The IDT did understand that the FORPLAN model was used to generate future habitat estimates on each National Forest. The IDT made the decision to not use one regional definition or description of owl habitat because suitability conditions vary widely by forest type, physiographic province, latitude, elevation, aspect, and other factors. The IDT's approach was to allow the biologists and other local experts on each National Forest to devise and apply their local descriptions of habitat. Further information is contained in FEIS Appendix B, 12-14. See also the response to the fourth comment on page L-A-28 which states: "Explanation of the recruitment rates are found in the FEIS in Chapter 3&4 Viability Assessment and Assumptions, and in Appendix B."

A phone call revealed that the Mt. Hood National Forest assumed that stands that averaged 11" d.b.h. with 40 percent crown closure provided suitable nesting, roosting and foraging habitat. Obviously, the Mt. Hood mistakenly used the ISC's criteria for dispersal habitat (the so-called "50-11-40 rule"), rather than the ISC's definition of nesting, roosting and foraging habitat. ISC Report at 1. Other forests may have made similar errors, though the IDT would be unaware of them.

Reply - Information on owl habitat was refined between the preparation of the DEIS and FEIS. Direction for mapping owl habitat for this FEIS was provided in the letter of October 4, 1991, 2670/1950/2410 to Region 5 and 6 Regional Foresters from Jerald N. Hutchins. Interdisciplinary team members visited specialists from each forest to clarify direction. Owl habitat was to include only nesting, roosting, and foraging habitat and not dispersal habitat. Forest personnel mapped owl habitat based on owl use and stand characteristics. Some areas with 11 inch d.b.h. trees could have been mapped if they included characteristics of spotted owl habitat.

In addition, though the DEIS considers habitat recruitment, it fails entirely to consider or assess the rate of habitat attrition within HCAs as a result of fires, wind, and other causes. Even if the Forest Service had a rational basis for taking credit for habitat recruitment, which it does not, it cannot ignore the other side of the coin.

Reply - Expected losses to fire, blowdown, and other causes is one reason predicted ingrowth of habitat is capped at 80% of the tentatively suitable lands (see FEIS, p. B-13).

⁸ The Forest Service's failure to respond to Dr. Orians is glaring given that the court in SAS particularly noted that "[t]he Forest Service may decide that Dr. Orians is mistaken, but it has not done so yet." SAS, 771 F.Supp. at 1094. The DEIS certainly does nothing to cure this failure.

Reply - The comments and concerns of Dr. Orians were specifically addressed by the ISC scientists during the evidentiary hearing of SAS vs Evans. A purpose of the EIS was not to specifically address individual criticisms but rather to

consider all relevant information and to assess the viability of the owl under management alternatives. This was done in the EIS.

⁹ A Forest Service biologist who participated in the writing of viability section of the DEIS confirmed by telephone that the DEIS' assessment relied on the ISC report.

Reply - This allegation is incorrect. A number of biologists were present at the viability analysis meeting for the DEIS; however, none of those who contributed significantly to the viability portion of the DEIS held this view. Further, there was another meeting held to assess viability for the FEIS. The process and assumptions used to assess viability are documented in the FEIS.

The viability analysis relied on the 7 criteria to assess viability. The ISC Report was incorporated into the EIS by reference and to that extent, the ISC Report was relied upon. However, the viability analysis used in the EIS was independent of the ISC Report.

¹⁰ A possible explanation for the similarity may be that the same Forest Service biologists who played major roles in the SEIS also prepared the DEIS -- Kathy O'Halloran and Bruce Marcot. It has proven difficult to determine who is actually responsible for the viability assessment in the DEIS. Ms. O'Halloran disclaims any expertise in population viability analysis, while Dr. Marcot says that the viability rankings of "high" and "low" for the alternatives were determined by the Interdisciplinary Team (Ms. O'Halloran is the only biologist on the IDT), and he was not involved in that determination. The only document in the administrative record that attempts to explain the basis for the viability rankings does not explain anything; it merely provides conclusory statements of viability rankings for eight separate factors, which are not accumulated for a total score. Apparently the determination of the accumulated score was performed by the IDT, which has no expertise in viability analysis. As noted above in the text, Dr Raphael's explanation is the most parsimonious; according to Dr. Raphael, the ISC plan was used as the benchmark for evaluating the DEIS' alternative. Thus it would appear that the DEIS' viability assessment is no more than a smokescreen for the actual determination, which relied on the ISC plan.

Reply - Ms. O'Halloran did not work on the SEIS. Further, see the replies to S59 through S63, and pages 3&4-3 through 100 of the FEIS for discussion on the viability analysis conducted for the FEIS.

RESPONSE TO COMMENTS FROM NORTHWEST FOREST RESOURCE COUNCIL

Comments made by Northwest Forest Resource Council, in their December 26, 1991 letter to Jerald N. Hutchins, on the Draft Environmental Impact Statement on the Northern Spotted Owl. Comments are numbered and followed by a response.

[*N1] The purpose of this letter is to provide comments on the Draft Environmental Impact Statement on Management for The Northern Spotted Owl in The National Forests (DEIS). The Northwest Forest Resource Council is an umbrella organization representing 15 regional forest products industry trade associations. All of the associations represent forest product companies that rely on the National Forests for their raw material supply. Therefore, the spotted owl issue has been a major focus of NFRC and its predecessor organizations for ten years. We have participated in every spotted owl administrative process to date. In addition, NFRC has been involved in the major lawsuits involving spotted owl management.

Reply - This comment does not lend itself to a specific response.

[*N2] NFRC has thoroughly reviewed and critiqued the DEIS during the public comment period. Our comprehensive comments are attached. NFRC has already submitted an alternative for consideration. We understand that this alternative will be included in the Final Environmental Impact Statement. Adoption of this alternative will provide a legally sound, scientifically justified, and more socially acceptable strategy for managing the spotted owl. Other alternatives besides this and the original ones presented in the DEIS could and should be developed which seek to strike a better balance between economic and social needs.

Reply - The NFRC alternative, called A Multi-Resource Strategy for Conservation of the Northern Spotted Owl, is included in the FEIS as Alternative E, but was no selected as the preferred alternative. See FEIS at pgs. 2-45-56, and Appendix K.

[*N3] NFRC is incorporating by reference the entire record of Seattle Audubon Society, et al. v. John L. Evans, et al. U.S.D.C. W.D. Washington, Civil No. C 89-160WD. NFRC has been an active intervenor in all the proceedings in that case. This lawsuit lead [sic] to the development of the DEIS and has played a significant role in the review and deliberation of the scientific basis of the alternatives in the DEIS. We are also including transcripts of the depositions of Jack Ward Thomas, Joseph Lint, Barry Noon, Jared Vernor, and Eric Forsman from Portland Audubon Society, et al., v. Manuel Lujan, JR., Civil No. 87-1160-FR. (Transcripts for the Noon, Vernor, and Forsman depositions are on Word Perfect 5.1 computer disks which accompany this document.) All of these individuals were members of the Interagency Scientific Committee to address the Conservation of the Northern Spotted Owl.

Reply - This comment does not lend itself to a specific response.

We are including the following reports and comments previously prepared by NFRC:

[*N4] 1. Depositions of Jack Ward Thomas. Taken in behalf of Defendants-Intervenors, (Portland Audubon Society, et al, Plaintiffs vs. Manual Lujan, JR., in his official capacity as Secretary, United States Department of Interior), Thursday, February 21, 1991.

[*N5] 2. Deposition of Joseph B. Lint, Taken in behalf of the Northwest Forest Resource Council (Portland Audubon Society, et al, Plaintiff vs. Manual Lujan, JR., in official capacity as Secretary United States Department of Interior), April 2, 1991.

[*N6] 3. NFRC Technical Review of the Draft Supplement to the Environmental Impact Statement for an Amendment to the Pacific Northwest Regional Guide, November 17, 1986, Technical Committee Report Comments.

[*N7] 4. Letter to James F. Torrence, November 17, 1986, with Legal Analysis of NFRC on the Draft Supplement etc., November 17, 1991, Presented by Preston, Thorgrimson, Ellis & Holman.

[*N8] 5. Letter to James F. Torrence, October 13, 1986, with Comments Queries, Concerns on SEIS by Larry L. Irwin, Wildlife Specialist.

[*N9] 6. Summary and Critique of the Spotted Owl Conservation Strategy Proposed by the Interagency Spotted Owl Committee Final Report Issued may 1990 - "An Industry Review of the Thomas Report" By: North West Timber Association, June 1991.

[*N10] 7. Letter to Secretary of Agriculture, January 23, 1989, with NFRC vs. F. Dale Robertson, Chief, U.S. Forest Service.

[*N11] 8. Appendix 1 - East Side Habitat Definition Problems--A case Study.

[*N12] 9. Comments of the Northwest Forest Resource Council submitted to the United States Fish and Wildlife Service Regarding the Status Review Supplement, Revised Finding and Proposed Rule Determining the Northern Spotted Owl as a Threatened Species Pursuant to the Endangered Species Act on December 20, 1989.

[*N13]10. Comments on the Designation of Critical Habitat for the Northern Spotted Owl Proposed by the U.S. Fish & Wildlife Service on May 6, 1991, 56 Fed. Reg. 20816.

[*N14]11. Letter to Dale Hall Re: Comments on the Revised Proposed Rule to Designate Critical Habitat for the Northern Spotted Owl.

[*N15]12. A Facade of Science: An Analysis of the Jack Ward Thomas Report Based on sworn Testimony of Members of the Thomas Committee.

[*N16] We appreciate the opportunity to respond and comment on this most critical issue. We stand ready to work with the Northern Spotted Owl Team to explain our comments or examine ways to improve the final EIS.

Reply - Comments *N4 through *N16 do not lend themselves to a specific response.

SUMMARY

[*N17] The Northwest Forest Resource Council ("NFRC") has conducted a detailed review of the Draft Environmental Impact Statement on Management for The Northern Spotted Owl in The National Forests ("DEIS"), the Draft and Final Environmental Impact Statements and Final Supplement to the Environmental Impact Statement for an Amendment to the Pacific Northwest Regional Guide, Federal Court documents pertaining to the Seattle Audubon v. Robertson and Portland Audubon v. Lujan, the Status Review Supplement, Revised Finding and Proposed Rule Determining the Northern Spotted Owl as a Threatened Species, Proposed Designation of Critical Habitat for the Northern Spotted Owl and A Conservation Strategy for the Northern Spotted Owl (ISC Strategy). Based on this review, the NFRC requests the U.S. Forest Service ("Service") to reissue the Draft Environmental Impact Statement with additional alternatives which envision less economic impact than Alternatives B and pose varying levels of risk to the northern spotted owl.

Reply - The FEIS does include Alternative E as an alternative considered in detail. This alternative, which was developed and submitted by timber industry organizations (see comment *N2 above) did explore and disclose the environmental effects of an alternative with less economic impact than Alternative B. Alternatives B, C, and D all meet the underlying purpose and need of the EIS--to ensure the viability of the northern spotted owl. This need responds to both the requirements of the injunction and the 36 CFR 219.19 regulation. An alternative that would pose greater risk to the owl would not meet this need, and therefore would not be a basis for reissuing the DEIS.

The NFRC's review of the documents listed above demonstrates the following:
[*N18] 1. The ISC Strategy is overly conservative, based on mitigating the effects of the worst case scenario for the owl. It does not address likely scenarios and is therefore inappropriate as a preferred alternative.

Reply - The ISC Strategy, and the analysis of Alternatives B, C, and D are based on what the interdisciplinary team and the viability assessment panel saw as the most reasonable assumptions and most likely scenarios. Those assumptions are clearly identified in the relevant sections of the FEIS and its appendices. Other commenters have argued that those assumptions are very optimistic.

[*N19] 2. A large quantity of new research information has become available since the ISC Strategy was formulated. This research supports the development of strategies which incorporate a greater amount of active management and lesser degrees of preservation land set-a-sides.

Reply - This issue is addressed in part in the response to the second comment on page L-A-26 of the FEIS which states: "The preparation of this EIS included a review of relevant scientific studies that have been published or are still in progress since the ISC published its Conservation Strategy. Appendix D, Annotated Bibliography, provides a summary of published and unpublished reports

reviewed. No conclusions on spotted owl biology or habitat needs were changed from the ISC Report after reviewing this literature.

"New information from ongoing studies in northern California and the east side of the Washington and Oregon Cascades might help clarify habitat use and characteristics in these provinces after these studies are completed, analyzed and peer reviewed.

"In addition, northern spotted owl habitat acres were updated in this document to represent the most recent information from each National Forest."

Further, this issue is addressed in the third comment on page L-A-27 which states: "The most recent owl data were used in this EIS. The ISC Report did not mandate any level of spotted owl populations for their conservation strategy. Both the ISC Report and the analysis in this environmental impact statement predict that more spotted owls will be found with increases in survey efforts, which does not conflict with assumptions made about potential owl populations in either document. Neither the ISC Report nor this EIS is a northern spotted owl recovery plan."

In addition this issue is addressed in the response to the third comment on page L-A-29 which states: "The basic conclusion that northern spotted owls prefer habitats with structural characteristics usually found in older forest has not changed and has been consistently supported by research since the mid-1970's. As survey intensity has increased over the last several years more northern spotted owls have been found in fragmented and second-growth forests. There are no studies that support the assumption that spotted owls thrive in fragmented forests, 'thrive' being equated with long-term pair existence with high offspring survival. Forests that are inhabited by spotted owls have varying degrees of fragmentation. Research has shown that as owl habitat within home ranges decreases, home range size of spotted owls increases. Usually, as habitat decreases it is accompanied by an increase in fragmentation.

It is believed that dispersing spotted owls will use younger forests. However, where reproductive pairs have been found in second-growth forests, remnant patches of older forest or younger stands that have developed older forest characteristics also occur. Often the nest sites are in older trees."

This issue is also addressed in the response to the fourth comment on page L-A-32 which states: "Artificial propagation and artificial habitat development are available options. However this type of intensive hands-on management is usually used as a last resort to save a species from extinction. Such measures are viewed as high risk because of the amount and frequency that individuals of the species would have to handled. Without adequate amounts of quality habitat available to transfer northern spotted owls into, success of introduction and reintroduction programs is limited. Another concern is the lack of available owls for such action. If habitat is not available in sufficient amount and distribution then spotted owl populations are expected to be low in all areas and thus there will not be surplus owls for transfers. The risk to the species, balanced with the low likelihood of success does not result in a high priority for action.

"Protecting habitat and populations in the wild is the first step to recovering a species from threatened or endangered status. Silvicultural manipulations of habitat have not been demonstrated to be beneficial to northern spotted owls. However, if silvicultural manipulations are conclusively demonstrated to enhance or provide spotted owl habitat then this type of management could be incorporated through the adaptive management process."

[*N20] 3. The viability analysis procedure used in the DEIS is poorly documented and should be replaced by a more scientifically rigorous procedure.

Reply - The viability analysis was refined between the DEIS and the FEIS.

[*N21] 4. The basic assumption stated on page 5 of the DEIS Summary that the harvesting of older forests impacts owl habitat and viability is misleading if not erroneous. Suitable spotted owl habitat is far more complex than just the amount of older forests. The recognition of amounts and spacial configurations of habitats used for nesting, roosting, foraging and dispersal is lacking in the DEIS and must be thoroughly explored before a real life alternative can be developed.

Reply - The predominance of the research literature on the northern spotted owl shows successful breeding pairs have a preference for old growth stands. The statement that "Since older forest areas are central to the owl's habitat, harvesting these older stands impacts owl habitat and viability" is neither misleading nor erroneous.

It is correct that spotted owl nesting, roosting and foraging habitat is very complex. However, "the fundamental issue surrounding the status of the northern spotted owl is one of habitat loss" (Anderson et al. 1990). This cannot be ignored. The amount and configuration of owl habitat was considered in the viability assessment of the spotted owl, see Criteria Used to Assess Viability, FEIS chapter 3&4 - 47 to 50.

[*N22] 5. The majority of the research used to justify the ISC Strategy is derived from correlational studies that did not study cause and effect relationships. These studies do not address questions of the effects of partial harvest on habitat suitability, the effects of fragmentation on reproductive rates, the habitat description of dispersal habitat, the structure and possible age at which habitat becomes suitable for the owl's 4 basic needs (nesting, roosting, foraging and dispersal) or the importance of any regional sub-population on the viability of the species.

Reply - Cause and effect relationships can be inferred and substantiated from the replicated studies and patterns of consistent findings. The central issue is the scientific credibility of the ISC Report. This issue is addressed in the response to the first comment on page L-A-23 of the FEIS which states: "The ISC Report Strategy for the northern spotted owl is scientifically credible for several reasons. First, the scientific method was used to develop the strategy. Strategies were tested and adjusted with the best available quantitative data and other information including modeling. Second, each member of the committee has credentials, experience, and reputations appropriate to the task. Third, published literature, reports and ongoing research was reviewed and considered when developing the strategy. Finally, the report was

subject to thorough peer review by professionals selected by the following societies: The Wildlife Society, Society of American Foresters, Society for Conservation Biology, The American Ornithologists' Union, and the Ecological Society of America (USDA Forest Service 1991a, Question #15)."

New information on habitat needs is addressed in the response to the third comment on page L-A-29, which was quoted in the reply to *N19 above.

[*N23] 6. The quantitative measures in the standards and guidelines of the ISC Strategy were developed using one conservative decision after another. These were then written as minimums. The actual application of the standards and guidelines go way beyond what is supported by empirical evidence.

Reply - The assertion that the ISC Strategy is based on conservative decisions is unsubstantiated. Other commenters contended that the assumptions used in the ISC were too optimistic. The ISC Strategy is scientifically credible and is founded on empirical data.

[*N24] 7. The impacts of not allowing timber management on the vast acreages proposed in Alternatives B,C, and D on insects and disease, fire and fuels management and the availability of Pacific Yew has not been thoroughly analyzed.

Reply - This issue is addressed in the replies to *N116 through *N124 below.

[*N25] 8. The impacts on water quality and fish habitat are misleading and should be revised, expanded and updated to reflect the negative as well as positive effects of prohibiting timber management on large tracts of land.

Reply - This issue is addressed in the response to the first comment on page L-A-66 of the FEIS which states: "The effects on water quality and fisheries habitat was identified where management of spotted owl habitat was estimated to have an effect. It is beyond the scope of this document to address the effects of timber harvesting on water quality, fish habitat, and old-growth forests. These potential effects would be addressed in the Forest Land and Resource Management Plans. The DEIS does display how each alternative would affect acres of existing old growth."

This issue is further addressed in the replies to *N125 through *N149 below.

[*N26] 9. The DEIS fails to adequately portray the effects of the alternatives upon the minerals and energy resources.

Reply - This issue is addressed in the replies to *N152 to *N155 below.

[*N27]10. The EIS portrayal of the impact of alternatives upon recreational opportunity is troubled by contradiction, excess and omission. From the onset, non-motorized recreation is cast as being in short supply, and roaded recreation opportunity is viewed as being in surplus which is not substantiated by reliable data.

Reply - This issue is addressed in the response to the fourth comment on page L-A-71 of the FEIS which states: "A shortage of opportunity for non-motorized

recreation is seen in the State Comprehensive Outdoor Recreation Plan 'Recreation Needs Bulletin' for Oregon in 1991. An exhaustive reexamination of recreation planning data and projections is not appropriate for an analysis of effects of this proposed action."

This issue is further addressed in the replies to *N159 through *N167 below.

[*N28]11. The DEIS provides inadequate discussion related to transportation systems issues, focusing upon only the negative side of this issue (ie roads can increase sedimentation of streams). In addition, consideration of socio-economic consequences are entirely absent from the discussion.

Reply - This issue is addressed in the reply to *N168 to *N170 below.

[*N29]12. The economic and community consequences of the alternatives are incorrect and poorly displayed.

Reply - This issue is addressed in the reply to *N173 to *N235 below.

COMMENTS OF THE NORTHWEST FOREST RESOURCE COUNCIL SUBMITTED TO THE UNITED STATES FOREST SERVICE REGARDING THE DRAFT ENVIRONMENTAL IMPACT STATEMENT ON MANAGEMENT FOR THE NORTHERN SPOTTED OWL IN THE NATIONAL FORESTS December 27, 1991.

GENERAL COMMENTS REGARDING ALTERNATIVE B: THE ISC STRATEGY

[*N30] The ISC plan represents an ultra-conservative management option which is inappropriate for the Service to select as a Preferred Alternative

Reply - Alternative B was recommended as the preferred alternative because, of the three alternatives that provide for a high likelihood of viability for the northern spotted owl, it has the least economic impacts. Others who commented on the DEIS strongly criticized the Forest Service for this mangement plan claiming it was too optimistic.

[*N31] The ISC plan is "built on a foundation of five concepts of reserve design that are widely accepted among specialists in the fields of ecology and conservation biology". Report at 23. Being "widely accepted" is not defined or supported does not necessarily mean the concepts have firm roots in scientific experimentation.

Reply - The scientific credibility of the ISC has been established and was also addressed in reply to *N5 above.

The five concepts are:

[*N32]1. Species that are well distributed across their range are less prone to extinction than species confined to small portions of their range.

[*N33]2. Large blocks of habitat, containing multiple pairs of the species in question, are superior to small blocks of habitat with only one to a few pairs.

[*N34]3. Blocks of habitat that are close together are better than blocks far apart.

[*N35]4. Habitat that occurs in less fragmented (that is, contiguous) blocks is better than habitat that is more fragmented.

[*N36]5. Habitat between blocks function better to allow owls to move (disperse) through them the more nearly they resemble suitable habitat for the species in question (that is, blocks that are well connected in terms of habitat are better than blocks that are not). Report at 23.

Reply - Comments *N32 through *N36 are direct quotes from the ISC Report, and as such do not lend themselves to a specific reply.

[*N37] One of the aspects of the ultra-conservative nature of the ISC plan is that in developing the plan the team looked at each one of the five concepts independently rather than considering the interrelationship between them in making management suggestions. In other words, when deciding how big the HCAs' should be they did not consider spacing requirements. Theoretically size and spacing are somewhat interchangeable, i.e. very large blocks could be farther apart than smaller blocks. The ISC agrees with this theory as demonstrated in Appendix M of the ISC plan Figure M14. (Report at 255)

Reply - The ISC Strategy is an integrated plan that was developed with full consideration of all parts of the plan.

[*N38] The ISC went through many decision-points to design the conceptual framework into proposals on maps. At each of these steps the committee had a range of options, and at each step the committee selected an extremely conservative option. The conservative choices were made when determining the size of the HCAs', the spacing of the HCAs', the forest characteristics needed inside the HCAs' and the forest characteristics needed between the HCAs'.

Reply - This issue is addressed in the reply to *N22 and *N23 above.

[*N39] Increasing the number of spotted owl pairs needed per HCA beyond 15-20 is not justified based on the documentation provided in the ISC Strategy

Reply - This issue is addressed in the response to the first comment on page L-A-38 of the FEIS which states: "The standards and guidelines in the ISC Report describe minimums for management of the northern spotted owl nesting, roosting, and foraging habitat. The standards and guidelines allow for variation throughout the range when actually mapping the Strategy. The team of biologists that mapped the ISC Strategy stated that the reason the size and spacing of mapped HCAs did not conform to the minimum standards and guidelines in Appendix Q of the ISC Report was because modifications were made to incorporate several considerations. Some HCAs were larger because they were isolated from other areas, located in or near areas of concern, or contained high proportions of areas of non-habitat within the HCA. Spacing of HCAs was closer than the minimum called for in the ISC Strategy to take advantage of habitat in Wilderness and known concentrations of spotted owls. Spacing in

some cases needed to be closer in order to map HCAs in areas of habitat on Federal lands.

"The size of each HCA is based on the need to provide habitat to a minimum of 15 pairs of spotted owls. The formula in Appendix I of the ISC Report uses 20 pairs of owls because it is believed that at any point in time the occupancy will be less than 100 percent. In using 20 pairs instead of 15, the formula allows for a vacancy rate of as much as 25 percent yet still maintain at least the minimum number of pairs (15) functioning at any one time. Habitat capability and cluster size is discussed in the population viability section, in Criteria 3 and 7, respectively."

[*N40] The committee relied on the "island biogeographical theory" to help it determine the number of pairs needed to be supported by each HCA. This theory is based on observing animal populations located on isolated oceanic islands. The "scientific" justification for this is based on scant empirical estimates of extinction rates for land birds on 16 islands off the coast of Britain. These estimates were made based only on censuses data taken over a number of years.

Reply - This issue is addressed in the reply to *N41 below.

[*N41] The empirical evidence relied upon only contained extinction data for population sizes between 2 and 10 pairs. (Report at 289) Even though the empirical data showed that no species went extinct when it contained more than 11 pairs the committee chose to utilize a linear regression model to justify larger populations. Dr Boyce has recently argued that "the use of a liner extrapolation is conservative since the time to extinction may actually increase exponentially with increases in number of pairs".

Reply - Criticisms of the ISC Strategy have been raised purporting that some of the assumptions and the approach used by the ISC was too conservative, that it protects too much habitat, while others have reviewed the same report and concluded that the assumptions in the ISC were too optimistic and therefore more protection should be afforded to spotted owls. However, the ISC Report has withstood extensive scrutiny and continues to be recognized by the experts and professional societies as a credible, scientifically sound piece of work. The ISC Report has received awards and recognition from The Wildlife Society and the Society for Conservation Biology.

[*N42] It should be noted here that in determining how large a habitat block should be, the committee wanted a size large enough that each block would be self perpetuating. This is why data from islands was used. Using this rational, only one habitat block is needed to sustain the local population. Viewing the current listing of the northern spotted owl, the basic theory utilized to support the ISC plan would argue that only one area large enough to support 20 pairs could be considered critical habitat but any more than this is unjustified.

Reply - It is unfounded that one large HCA could be considered essential and that any more HCAs are unjustified. It was assumed that HCAs will contribute to overall population stability as long as they are interconnected with adequate dispersal habitat. The HCAs act as "nodes in a metapopulation", not as isolated populations per se. Further clarification is provided in the

response to the third comment on page L-A-34 of the FEIS which states: "The size of HCAs is based on the need to provide a block of habitat that can support a cluster of at least 20 pairs of spotted owls. Smaller HCAs might be able to sustain a cluster of spotted owls over the short term. However, if the size of the clusters decreases, then the likelihood of persistence over the long term decreases. The viability analysis for this environmental impact statement used actual maps and spatial analyses to determine the habitat capability in designated areas managed primarily for spotted owl habitat."

Additionally, it is important to ensure that habitat is provided throughout the range of the owl. Providing for the owl in only a portion of its range, as would be if only one HCA was established would seriously compromise the viability of the owl.

This issue is also addressed in the reply to *N39 above.

[*N43] The decision to use 20 pairs as the target number of birds for each habitat block was further justified by the committee by the use of a computer model. However, the actual model results show very little difference between 15 and 20 pairs. The committee noted "Once clusters contain 15 suitable sites, however, increasing cluster size had little effect on the equilibrium level of mean occupancy (fig. M15)". (Report at 257)

Reply - This issue is addressed in the reply to comment *N44 below.

[*N44] Dr. Irwin has noted that the decision to increase the size from 15 to 20 pairs was based on the assumption that only 75% of the suitable sites would be occupied, i.e. 75% of 20 is 15. Dr Irwin has stated, "Empirical evidence now indicates that long term occupancy in clusters of pairs is likely to be higher than 75%, in part a result of an apparently large population of non-breeding adults, or "floaters", that replace territorial adult owls that die or leave".

Reply - The issue of the size of the HCAs has been previously questioned and answered by the ISC Committee, please refer to the answer, in part, to question #23 of the February 1991 Questions and Answers on the ISC Report, " Our initial efforts to map large blocks of habitat led us to conclude that a size large enough for about 20 pairs of spotted owls was feasible in terms of how habitat existed on the ground. Locating reasonably compact tracts of suitable habitat with more than 20 pairs proved to be difficult because of previous loss of habitat to fire and logging. At that point we began to seek empirical and modeling data to test the hypothesis that 20-pair HCAs would be too small for subpopulations to persist for several decades with low-to-moderate rates of immigration and emigrations. Both types of data supported a conclusion that subpopulations of 15 or more pairs tend to survive for such reasonably long periods, if they are supplemented with some amount of exchange of individuals between subpopulations. Based on monitoring results to date, however, we know that all periodically occupied territories are unlikely to be occupied by breeding pairs at any given time. Consequently, we concluded that HCAs should be large enough to provide for 20 or more potential pairs, which we anticipate will give reasonable assurance of at least 15 actual pairs occurring per HCA at any given time."

Further, "the computer model was not used to select the size of HCA; it was used to test various hypotheses about their size and their likelihood to provide for long-term occupancy by pairs of owls " (USDA Forest Service 1991a, #37 in part).

This issue is also addressed in the reply to *N39 above.

[*N45] The computer simulation model the ISC used also found that having 12 suitable sites within the 20 pair habitat area was just as effective as having all 20 sites suitable. (Report at 259-261) This would argue that the areas could be smaller or that management activities could be allowed within the HCAs' as long as 12 home ranges within the 20 pair cluster maintained at least 50% suitable habitat (the average amount of suitable habitat currently found within spotted owl home ranges).

Reply - This issue is addressed in the reply to *N39 above.

[*N46] When the standards and guidelines were applied to maps, the committee took the conservative 20 pair recommendation and actually expanded on it. The Category 1 HCAs' average 24 pairs. The number of territories capable of supporting pairs is even larger than 24 as the committee applied a downward adjustment factor shown in Table Q3 when it determined future expected pairs. (Report at 322)

Reply - This issue is addressed in the reply to *N39 above.

[*N47] Therefore, the committee had empirical evidence which showed that at least 11 pair were needed and a computer model which showed 12-15 pair were needed but they chose to use 20 pair as the standard and then actually drew them to accommodate an average of 24 pair. The USF&WS has no scientific or other biological basis to enlarge the proposed HCAs' beyond what is necessary to accommodate 20 or for that matter 12-15 pairs.

Reply - This issue is addressed in the reply to *N39 above.

[*N48] Once the committee decided to use 20 pair clusters, they then needed to determine how large to make the HCAs'. Appendix I: Home Range describes the process used by the committee. Pair home range data from eleven sources were used to determine median year long home ranges for pairs of owls. The size of the HCA was then determined to be the home range size times the number of pairs times .75. The 25% reduction was made as a recognition of the fact that home ranges often overlap.

Reply - This issue is addressed in the reply to *N39 above.

[*N49] These decisions are very conservative. Using year long home ranges overestimates the area needed by the owl for the most critical period, the breeding season. The territory occupied by the pair during breeding season is much smaller than outside of the season. After the young have fledged, the pair no longer have to be concerned with bringing food back to the young and therefore can roam in their search for food.

Reply - Others believe these decisions are too optimistic. Decision were based on the best empirical data available. This concern is also addressed in the reply to *N41 above.

[*N50] Just because owls wander in this process and cover large areas is not evidence that this amount of land is needed for the owls persistence. In fact, 25% of the radio tagged juveniles referred to in Table P1 of the ISC plan traveled in excess of 50 miles. Adult birds have the capability to travel further. The amount of land needed for owls to successfully breed and raise young is much smaller than the total land occupied by a pair. This smaller amount, probably in the neighborhood of 300 to 500 acres, would be more appropriate for determining the extent of critical habitat.

Reply - This conclusion is not supported by the scientifically conducted research.

[*N51] Since the ISC plan is a long term plan, the mapped HCAs' should represent what is necessary in the future for the long term persistence of the owl throughout its range. Keeping with this line of thinking, the future condition of the HCAs' should be the guidepost for determining their size. The committee believes that if the proportion of suitable habitat within the home range is smaller, the size of the home range is bigger. (Report at 197)

Reply - The ISC Strategy provides for the viability of the owl in both the short-term and the long-term.

[*N52] The average amount of suitable habitat within the home ranges examined by the committee ranged from 37% to 61%, Figure 1. The amount of suitable habitat expected in the future within the HCAs' is 70%. The amount of land allocated to each pair in the future condition should therefor [sic] be less than what is being used today because more of the land will be in a suitable condition. The committee did not recognize this and utilized the current condition to determine what is needed by owls in the future.

Average Amount of Suitable
Habitat Within Home Range

Reply - The ISC Committee did recognize that the percent of suitable owl habitat in HCAs is expected to increase. The ISC Strategy provides for the viability of the owl for both the short-term and the long-term. This concern is also addressed in the replies to *N39 though *N52 above.

[*N53] The amount of overlap in territories is also conservative. Dr. Boyce has recently stated that in many cases is greater than 25%. The ISC plan adds to its already conservative size requirements by exceeding its own recommendations when HCAs' were actually mapped. The amount of land allocated for each pair is almost 30% greater than that specified in Appendix I. By using the home range data and formula for determining HCA size as provided in Appendix I, the amount of land needed to support the number of pairs within the mapped HCAs' is 4.9 million acres as opposed to 6.8 million acres mapped by the ISC. (See Figure 2)

Acreage and Population Estimates
Habitat Conservation Areas
(Based on Future Owl Populations)

Figure 2

Therefore, the ISC not only underestimated the actual overlap of home ranges but did not even utilize this factor when drawing HCAs' using an average of 5% more of the full year long home range per pair instead of 25% less.

Reply - This issue is also addressed in the replies to *N39 though *N52 above.

[*N54] Because the ISC drew many of the HCAs' much larger than the 20 pair standard, one could argue that the size of the HCAs' could be further reduced by limiting the size to 20 pairs. By doing this the amount of land

needed inside this HCA network would be approximately 4.3 million acres.
(See Figure 3)

Reply - This issue is also addressed in the replies to *N39 though *N52 above. If future research and monitoring confirms that HCAs can be reduced in size, the adaptive management process will allow for that reduction.

[*N55] The size of the HCAs' as specified by the standards and guidelines and then as they were actually drawn is much larger than what is needed to support the number of pairs currently expected to inhabitant the HCAs'. Only a portion of these ultraconservative mega-clusters are currently suitable habitat and only a portion of the suitable could be deemed essential for the conservation of the specie.

Reply - This issue is also addressed in the replies to *N39 though *N54 above.

Acreage and Population Estimates
Habitat Conservation Areas
(Based on Future Owl Populations)

Figure 3

[*N56] Decreasing the distance between HCAs' to less than 12-15 miles is not scientifically supported

Reply - This issue is addressed in the response to the first comment on page L-A-39 of the FEIS which states: "In determining the spacing between HCAs, the Committee had data on the dispersal capabilities of spotted owls. Based on the lengthy discussions of appropriate distances between HCAs, the Committee concluded that the distance between large HCAs (20+ pairs) should be within the observed dispersal distances of at least two-thirds of all radio-tagged juveniles. This was reviewed by five technical experts selected by professional societies. Only one reviewer, Dr. John Wiens, questioned this process. In the Committee's follow-up conversations with Dr. Wiens, he responded that he could suggest no better method for arriving at the decision and that he was satisfied

with the two-thirds guideline that the Committee adopted. For additional information see USDA Forest Service, 1991b, Question 31."

[*N57] Starting with the concept "blocks of habitat that are close together are better than blocks far apart" the committee had to make a determination as to how far apart the HCAs' should be. They recognized the need for intermingling HCA populations to maintain genetic viability and for the purposes of demographic rescue.

Reply - This comment does not lend itself to a specific response.

[*N58] Biologists have never been concerned about the genetic viability of the northern spotted owl. Dr. Boyce recently stated, "Only one or two viable disperses per generation are necessary to swamp the consequences of inbreeding". Since a generation is somewhere between 8 to 15 years, the probability of genetic isolation and inbreeding is very remote.

Reply - Potential isolation of northern spotted owl subpopulations is discussed in the FEIS chapter 3&4 - 27 to 28 and was discussed in USDA Forest Service 1988b (SEIS) and is a factor in delineating areas of concern.

[*N59] Demographic rescue pertains to the ability of a species to recolonize an area after its original population has been wiped out. The major causes for a population to decline is the destruction of its habitat. In the case of a HCA network, this would most likely occur due to wind or fire. If an HCA was destroyed, many years would be required to [sic] for the habitat to grow again making quick recolonization of the area a mute point.

Reply - The probability of a single catastrophic event destroying an entire large HCA is less than of destroying a small area of habitat and was one of the reasons for their size (discussed in FEIS chapter 3&4 - 28). Frequently modification of owl habitat by wind or fire is not complete (discussed in FEIS chapter 3&4 - 19 to 20).

[*N60] The other mechanism for the elimination of an HCA population is the presence of a predator, parasite or disease. Given the large areas encompassed by an HCA and the amount of suitable habitat within an HCA, the likelihood of this occurring is extremely remote. Given the slight chances of this type of demographic catastrophe, other management options are available to relieve this concern. One such possibility is to allow a longer time period for recolonization or to use a capture/release program to reintroduce the owl in these area.

Reply - This issue is addressed in the response to the fourth comment on page L-A-32 of the FEIS which states: "Artificial propagation and artificial habitat development are available options. However this type of intensive hands-on management is usually used as a last resort to save a species from extinction. Such measures are viewed as high risk because of the amount and frequency that individuals of the species would have to [be] handled. Without adequate amounts of quality habitat available to transfer northern spotted owls into, success of introduction and reintroduction programs is limited. Another concern is the lack of available owls for such action. If habitat is not available in sufficient amount and distribution then spotted owl populations

are expected to be low in all areas and thus there will not be surplus owls for transfers. The risk to the species, balanced with the low likelihood of success does not result in a high priority for action.

"Protecting habitat and populations in the wild is the first step to recovering a species from threatened or endangered status. Silvicultural manipulations of habitat have not been demonstrated to be beneficial to northern spotted owls. However, if silvicultural manipulations are conclusively demonstrated to enhance or provide spotted owl habitat then this type of management could be incorporated through the adaptive management process."

[*N61] Based on the above, one would think the ISC would have used a mathematical model to determine how far apart HCAs' needed to be to ensure genetic viability, 1-2 individuals every 8-15 years, or to recolonize suitable habitat areas left vacant by disease or predation, for example 5-10 pairs in 20 years. They did not do this.

Reply - This issue is addressed in the reply to *N56 above.

[*N62] The ISC determined the distance between HCAs' without recognizing the fact that the HCAs' are so large as to be self sustaining units. This was in fact the criteria they used in determining size. They only looked at their basic concept that closer is better than farther and arbitrarily determined that using a linear distance in which 67% of a few radio tagged juveniles flew, 12 miles, was appropriate. The median dispersal distance for these 56 birds was 17 miles. The modal distance was 15 miles. The ISC erred on the side of conservatism by using 12 miles giving no rational as to what these dispersing juveniles would do once they arrived in the next nearest HCA.

Reply - This issue is addressed in the reply to *N39 and *N56 above.

[*N63] Because the HCAs' are self sustaining, the few owls which die each year will most likely be replaced by owls within the HCA. These could either be dispersing juveniles or members of the "floater" population. The number of floaters, or non-territorial birds, is unknown but is estimated to be rather high by some researchers. The reason for this estimate is that the vacated member of a pair is generally quickly replaced indicating that a single bird was close by waiting for the opportunity to replace a vacated spot. The question therefore remains what these 67% of the dispersing juveniles from adjacent HCAs' are going to do with most vacancies being filled from within.

Reply - Small, isolated populations might be difficult to maintain without genetic or demographic contributions from other populations (see FEIS chapter 3&4 - 27). This issue is also addressed in the replies to *N46 and *N58 above.

[*N64] The ISC added yet another layer of conservatism when they drew their HCAs' onto maps. The actual nearest neighbor distance from Category 1 HCAs' ranges from 4.2 miles in California to 8.3 miles in the Klamath province in Oregon. (See Figure 4)

Nearest Neighbor Distance
From Category 1 HCA's

The ISC made another arbitrary decision when it recommended that Category 2 HCAs' be no further than 7 miles apart. Again, when these were rendered to maps, the actual distances ranged from 3.8 miles to 7.3 miles (See Figure 5)

Nearest Neighbor Distance
From Category 2 HCA's
(HCA's with >5 future pair)

Figure 5

Reply - The issue of conservative verses optimistic assumptions and application of the ISC was addressed in the reply to *N41 above. This concern is also addressed in the replies to *N39 and *N56 above.

[*N65] The ISC recommended size of HCAs' and distance between HCAs' are so conservative that increasing them to what is mapped is not necessary

Reply - This issue is addressed in the replies to *N39 and *N56 above.

[*N66] The maps drawn by the ISC are far in excess from what the ISC recommended in Appendix Q. The standards and guidelines call for Category 1 HCAs' to be large enough to accommodate 20 pairs, contain 75% of the mean home range per pair and spaced 12 miles apart. Figure 6 and 7 show the average size and spacing of Category 1 HCAs' in Washington and Oregon.

HCA Size and Spacing Comparison
Category 1 HCA's in Oregon Cascades

HCA Size and Spacing Comparison
Category 1 HCA's in Washington

Figure 6

Figure 7

Reply - This issue is addressed in the replies to *N39 and *N56 above.

[*N67] The mapped HCAs' increase the size and decrease the spacing far and above what is justified in the body of the ISC strategy.

Reply - This issue is addressed in the replies to *N39 and *N56 above.

[*N68] There is no scientific justification for the 50-11-40 rule

Reply - This issue is addressed in the response to the third comment on page L-A-40 of the FEIS which states: "The basis for the 50-11-40 rule came from studies describing stand conditions used by spotted owls for foraging. Research indicates that most foraging occurs in habitat typified by old-growth forest structural characteristics, yet some amount of foraging does occur in younger stands. The environmental impact statement concluded that quarter

townships that met the 50-11-40 rule would support foraging and roosting needs for dispersing juveniles, and would likely cover enough of the intervening landscape to allow reasonable protection from predators during random dispersal and movement.

"Implementation of the Monitoring Plan (see Appendix J.) can provide insight into whether these standards and guidelines could be improved upon, or whether various proposals for standards and guidelines for dispersal habitat in the Forest matrix (for example, the 40-20'-40 standards and guidelines for the Multi-Resource Strategy) would prove acceptable."

[*N69] Many believe the ISC had a scientific basis for adopting the 50-11-40 rule and that this is what is actually necessary of owl dispersal. In fact, the ISC made the assumption that if agencies were following an 80 year rotation, 50% of the stands would be older than 40 years old and be greater than 11 inches in diameter and therefore, the 50-11-40 rule would not impact timber harvesting patterns. No assessment was made of what the owl actually needs to successfully disperse.

Reply - This issue is addressed in the reply to *N68 above.

[*N70] Some researchers have suggested that maintaining the forest matrix in a 50-11-40 condition in the presence of 7 Category 4 HCAs' per township and other old growth set-a-sides for interests such as riparian and viewshed management will actually create habitat suitable for breeding. A resent [sic] demographic study by Miller et al (1991) followed radio tagged spotted owls in 50-80 year old forests containing between 5-10% old growth. This area mimics the 50-11-40 forest matrix. In this area over 30 pairs were found and 5 of 14 pairs that were monitored produced 9 fledglings. This is the first study conducted in these types of areas and provides the first scientific evidence that spotted owls are thriving in areas with very little old growth.

Reply - The habitat capability analysis, criterion 3 (L-A-28), accounts for this possibility and displays estimates of pairs in the Matrix in Table 3&4 - 17. The Matrix alone does not provide adequate habitat capability to provide a viable population of spotted owls. This issue is also addressed in the response to the third comment on page L-A-28 of the FEIS which states: "Habitat within designated areas managed primarily for spotted owl habitat and within reserved areas would not be scheduled for timber harvest. The interdisciplinary team assumed the majority of land capable of growing trees would grow into spotted owl habitat using a specific growth curve based on local conditions for each National Forest. Future habitat outside of designated and reserved areas were estimated using analytic models as described in Appendix B."

[*N71] The final EIS should recognize the distinct biological differences between the Region' west-side Douglas-fir forests and the dryer, less productive pine forests typical of spotted owl habitat on the Region's east-side national forest (the Winema, Deschutes, Wenatchee and Okanogan). Specifically, the analysis should include an objective examination of alternatives to the 50-11-40 rule for application on these national forests.

Reply - This issue is addressed in the response to the sixth comment on page L-A-28 of the FEIS which states: "The interdisciplinary team considered the variation in spotted owl habitat and home range size between physiographic provinces. Local knowledge and experience with spotted owl habitat was relied upon for the delineation of northern spotted owl nesting, roosting, and foraging habitat in each National Forest. The EIS does not recommend any habitat manipulation activities in HCAs."

[*N72] We are concerned that rigid enforcement of the 50-11-40 rule on the east-side national forests could adversely affect both timber production opportunities within the areas covered by the rule and the Forests' ability to maintain quality spotted owl dispersal habitat within these areas. Given the inherently low site productivity typical of many [sic] east-side pine stands, it may not be possible to meet the 50-11-40 rule in many areas without severely limiting (or even precluding) timber harvest activities. In addition to the impact such restriction would have on the Forests' Allowable Sale Quantities and the welfare of local timber-dependent communities, such restrictions would also effectively preclude utilization of the silvicultural practices required over the long term to avoid the development of stand conditions that are highly susceptible to large-scale insect and disease problems, extensive tree mortality, large fuel accumulations, high-intensity wildfire and potentially catastrophic losses of owl dispersal habitat.

Reply - This issue is addressed in the reply to *N71 above.

[*N73] In view of these concerns, we believe that the Forest Service must: (1) consult with its entomologists to identify the upper limits on the volume of biomass which can be supported on east-side pine sites without significantly increasing the risk of large-scale losses from insects, diseases, and wildfire; (2) determine whether or not the 50-11-40 rule can be met on such sites without exceeding these biomass limits; and (3) determine the minimum stand conditions (canopy closure, etc.) which will provide effective owl dispersal habitat without imposing excessive constraints on the Forests' ability to maintain forest health (and owl habitat) over the long term. The results of this analysis must be included in the final EIS. If the results show that rigid imposition of the 50-11-40 rule would excessively constrain the Agency's ability to maintain long-term forest health on the east-side national forests, the selected management alternative should provide sufficient flexibility for these Forests to develop alternative management standards for owl dispersal habitat -- based on the best currently available information -- which are biologically compatible with east-side forest conditions and site productivity.

Reply - This issue is addressed in the response to the second comment on page L-A-26 of the FEIS which states: "The preparation of this EIS included a review of relevant scientific studies that have been published or are still in progress since the ISC published its conservation Strategy. Appendix D, Annotated Bibliography, provides a summary of published and unpublished reports reviewed. No conclusions on spotted owl biology or habitat needs were changed from the ISC Report after reviewing this literature.

"New information from ongoing studies in northern California and the east side of the Washington and Oregon Cascades might help clarify habitat use and

characteristics in these provinces after these studies are completed, analyzed and peer reviewed.

"In addition, northern spotted owl habitat acres were updated in this document to represent the most recent information from each National Forest."

This concern is also addressed in the response to the first comment on page L-A-27 which states "This EIS focuses on measures necessary to protect and manage northern spotted owl habitat. It recognizes that, because not all areas have been surveyed, more spotted owls exist than are currently known and that more spotted owls will likely be found in the future. The location and number of spotted owls found to date does not conflict with the assumptions used in this environmental impact statement or in the ISC Strategy."

The ISC Strategy incorporates a research and monitoring plan to investigate habitat relationships, including issues raised above. Results from monitoring and research can be used in the adaptive management process to revise the standards and guidelines as appropriate.

[*N74] New research has not been recognized or incorporated

Reply - This issue is addressed in the reply to *N73 above.

[*N75] At least two years of research data has been collected since the ISC strategy was developed. During this time much has been learned about the effects of forest fragmentation on spotted owls and about their habitat use. Also the actual size and distribution of the population has changed. This research should have been used to develop additional management strategies which would cause less economic impact on the communities of the northwest and still not pose significant increases in risk to the viability of the species.

Reply - This issue is addressed in the reply to *N73 above.

[*N76] A recent survey of new research was submitted to the USF&WS on June 5, 1991 in Comments on the Designation of Critical Habitat for the Northern Spotted Owl Proposed by the U.S. Fish and Wildlife Service on May 6, 1991 56 Fed. Reg. 20816 by 16 forest products associations. This report is attached as part of our comments on the DEIS.

Reply - This statement does not lend itself to a specific response.

[*N77] The DEIS presents data which is different than that used by the ISC which may have altered its decisions. The amount of suitable spotted owl habitat has increased from 6.8 million acres to 7.6 million acres. This is an increase of 800,000 acres during a time when over 16 billion feet of timber was harvested. The number of known pairs of owls has increased from 2,022 pairs to 3,239 pairs, 200 of which are on private lands which according to the scientist contain no suitable habitat. This 60% increase in known owl pairs does not even reflect the increases on BLM lands in 1991 or the hundreds of territorial singles which are now being protected as if they were pairs.

Reply - This issue is addressed in the reply to *N73 above.

[*N78] Some of the new research include studies on the Eugene District of the BLM which show successfully reproducing pairs on lands with less than 10% older forests and the majority of the area less than 100 years old, studies on the Wenatchee National Forest which show reproducing nesting pairs in trees of virtually all size classes, not just in "old growth", and studies on the Roseburg District of the BLM have which indicate the influence of fragmentation have been greatly exaggerated. These studies support the notion that spotted owls are adapted to dealing with non contiguous habitat commonly found in our managed forests.

Reply - This issue is addressed in the reply to *N73 above.

COMMENTS REGARDING CHAPTER 2: THE ALTERNATIVES

[*N79] The Forest Service has failed to display and analyze a full range of alternatives. The difference between Alternative A and Alternative B is so great that the Forest Service must develop and analyze more alternatives within this range. The alternative developed and submitted to the Forest Service represents one such alternative. However, many other alternative strategies could be developed which try to seek a better balance between economic and social concerns. The Service should develop these alternatives and display the real tradeoffs between additional risk to the owl and economic impacts of the alternatives.

Reply - This issue is addressed in the response to the first comment on page L-A-14 of the FEIS which states: "It is a common misconception that NEPA requires an agency to consider a wide, or full, range of alternatives. What is required is that the agency explore and evaluate 'all reasonable alternatives' which respond to the 'underlying purpose and need' (40 CFR 1502.14(a) and 1502.13). The alternatives presented in Chapter 2 in this environmental impact statement meet these requirements." This concern is also addressed in the reply to *N17 above.

[*N80] New research warrants the development of alternative strategies which rely more on active management and less on land set-asides. This research is summarized in documents submitted with these comments. This research must be given thorough consideration. The research which supports the current belief that home ranges consisting of a majority of old growth forests must be critically analyzed for statistical significance and reliability. Inferences drawn from these studies should be limited to the original purpose of the studies. Generalities based on observational research are not appropriate in the management context.

Reply - The issue of the implications of new research information is dealt with in comments on L-A-26 through L-A-29 and in Appendix D of the FEIS, and referenced in the replies to *N22, and *N73 above.

Generalities based on an accumulation of observational studies with consistent findings, as well as generalities based on correlational studies with consistent findings, are very appropriate in the management context. The "new research" referred to consists primarily of observational studies.

[*N81] Alternative B is purported to apply only on lands administered by the Forest Service; unfortunately, that will not be true in practice. The owl is listed as threatened by the Fish and Wildlife Service, which has informed state forestry agencies that they will be held liable for "taking" of the owl if forest practices are not in agreement with those on federal lands. Thus, any management plan for spotted owls on federal holdings will have significant ramifications for adjacent private and state lands. This is especially true for private lands that are "encapsulated" within HCAs. The final EIS should recognize this.

Reply - Alternative B applies only to lands administered by the Forest Service. Private landowners' compliance with section 10 of the Endangered Species Act is not predicated on practices in agreement with those on Federal land. While the Fish and Wildlife Service may recommend similar practices for Federal and private managers because of information about a species and its habitat needs, the similarity of such recommendations would not be because of a requirement to be in agreement with practices on Federal lands.

[*N82] Most viability analyses review the probability of persistence (survival) of a population over specified periods of time. A more useful approach would specify more than the three viability likelihood levels specified in the DIES (High, Moderate, and Low). In the DEIS, a High rating denotes high likelihood, which doesn't say anything about relative probabilities. We suggest that the Forest Service develop a more quantified definition, such as Very High = >90% probability of long term persistence; High = 70-89% probability of survival for >100 years; Moderate = 40-60% probability; Low = 20-39% probability; and Poor = <20% probability.

Reply - A more quantified definition, such as suggested, would imply more precision than is currently appropriate for viability analysis. The relative merit of the alternatives was discussed in a qualitative manner and is presented in the Viability Rating section of the FEIS chapter 3&4 - 94 to 100.

[*N83] COMMENTS REGARDING CHAPTER 3&4; THE AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

PAGE 3&4-1-2

The statement is made that the "basic data and central relationships are sufficiently well established in the respective sciences that... new information is very unlikely to reverse or nullify understood relationships." Of course, it is a matter of opinion that sufficient and reliable information exists. The EIS team must recognize that nearly all of the available information on northern spotted owls has arisen from correlational studies that did not examine cause and effect relationships. Such correlational studies are not necessarily unassailable; in fact, most have equivocal conclusions.

Reply - This concern is also addressed in the reply to *N80 above. Observational and correlational studies properly conducted are a valid scientific basis for knowledge and policy. The basic data and central relationships concerning the spotted owl are well established.

[*N84] Until experimental evidence is provided about factors that regulate spotted owl populations and their prey, the only conclusion that can be made with confidence is that the available descriptive information can be used by agencies for making decisions to stop timber harvesting, because owls do not spend time in clearcuts. Concluding that the perceived relationships will not be modified with additional information is highly speculative. For examples, it was not until 1989 that scientists discovered significant numbers and reproduction by spotted owls in "second-growth" forests in northern California. That information and the recognition (by both the ISC and Anderson et al. 1990) of the potential for owls to be successful in forests that were managed using uneven aged methods most certainly nullified the belief that owls could only be successful in old-growth forests. Most likely, having experimental information most certainly would have led the DEIS team to develop more flexible alternatives or at least broader options within the alternatives.

Reply - This issue is addressed in the response to the third comment on page L-A-46 of the FEIS which states: "Research is ongoing to develop selection systems and harvest methods other than clearcutting, as well as to define habitat needs for the northern spotted owl. Research is also under way as called for in the ISC Strategy that will develop or identify silvicultural treatments that will benefit spotted owl habitat. Methods that meet the needs of owls and produce timber products will no doubt be identified. Use of such a strategy in place of designating specific areas to be managed for owl habitat was not considered as an alternative in this document because uncertainties in its potential success were not compatible with the need to move quickly to protect the threatened northern spotted owl."

[*N85] That basic relationships might be nullified is why the ISC recommended an initially conservative approach that would preserve habitats until new research documents how (not if) to provide high quality habitats within managed forests. Further, several scientists are now seeking ecological data that would provide the basis for a structural definition of habitat that provides life requisites for northern spotted owls. Clearly, the available scientific information regarding northern spotted owls is weak and must be upgraded to include experimental studies that are replicated over time and space.

Reply - While the interdisciplinary team (and likely the ISC) would disagree with the characterization of available information as "weak", the comment does parallel the rationale used in providing for research and monitoring plans coupled with an adaptive management process in the ISC strategy and in the Alternatives.

[*N86] Page 3&4-3: THE INTRODUCTION

The Introduction points out that much of the discussion contained in the DEIS is a summary of information that is covered more thoroughly in the ISC Report, although some new information is presented. The point to be made here is that the EIS team has uncritically accepted conclusions and interpretations of the ISC and other scientists. We believe that it is of paramount importance that available information should be reviewed critically prior to use in making decision of such far-reaching impact as that of the EIS.

Reply - The interdisciplinary team did not uncritically accept conclusions and interpretations of other scientists. In addition, the ISC strategy was peer reviewed (both during its development and following its release). All relevant and new information was reviewed and evaluated (see Appendix D.) This issue is also addressed in the reply to *N22 above.

[*N87] Page 3&4-10: HABITAT DEFINITIONS

Unfortunately, there still is no quantifiable, structural and compositional definition of suitable spotted owl habitat. The DEIS recognizes that (page 3&4-13), by noting that spotted owl habitat descriptions will change as new information becomes available. Such a structural definition, if one were available, would specify numbers and sizes of trees and understory, as well as amounts of snags, downed logs, and other values such as broken-topped trees. About the only conclusion that can be made now with the available information is that the life requisites for spotted owls apparently are found most frequently in a forest condition that has been classified as "old-growth"; and that the distribution of the structural features that comprise owl habitat most certainly extends beyond old-growth forests. Knowledge of such components would provide the basis for silvicultural prescriptions for producing suitable habitat.

Reply - This issue is addressed in the reply to *N73 and *N84 above.

[*N88] Also, the Final EIS should note that multi-layered forests are not necessarily uneven aged forests. Buchanan (1991) found a large number of spotted owl nests in forest stands that were even-aged, although these stands often contained multiple canopies due to differential rates of growth.

Reply - This issue is addressed in the reply to *N73 above.

[*N89] Page 3&4-14: DISPERSAL HABITAT

Dispersal habitat in the Preferred Alternative (i.e., the ISC's 50-11-40 rule) may provide more than perceived by the DEIS team. The final EIS should be careful to point out that the ISC had no empirical information to suggest the nature of dispersal habitat; they simply used their best guess. New information suggests that spotted owls actually will find better quality habitats than needed for dispersal in matrix habitats that fulfill the 50-11-40 rule, at least in some areas. A forest with 40% canopy with trees that average 11 or more inches in dbh could easily include several trees per acre that are larger than 24" dbh (which could provide nest trees), as well as numerous snags and downed logs. Miller et al. (1991), in fact, found 14 resident pairs of owls in 50-80 year-old forests that approximate a landscape managed under the 50-11-40 rule (< 10% old-growth), and that 6 of those pairs produced 9 fledglings in 1990.

Reply - This issue is addressed in the reply to *N73 above.

[*N90] Page 3&4-17: CURRENT HABITAT AMOUNTS AND TRENDS

The point is made that, "In a few areas, such as dryer (sic) portions of ranges like the east Cascades and northern California, spotted owl habitat has increased because of fire protection." Although no supporting evidence is presented for that statement, we believe it to be true. We request that

an estimate be made of the acreage that apparently advanced into suitable condition and became occupied by breeding pairs of owls in the past 70-100 years. Such a long period of fire suppression may have resulted in substantial acreages that would not have been suitable in the past. Furthermore, we request that an estimate be made of the habitat now occupied by owls that was cutover in the late 1800s and early 1900s. Such estimates would clarify the amounts of habitats that have been lost and gained in the past century.

Reply - In response to this comment a section on habitat amounts and trends was added to the FEIS in Chapter 3&4, pages 3&4-19 and 20.

[*N91] Page 3&4: ISSUES RELATED TO DISTRIBUTION

The conclusion is made that clearcut timber harvest not only removes habitat but influences the value of the remaining habitat by increasing the potential for invasion by alleged deleterious species of wildlife and altering the interior forest microclimate. Once again, readers are asked to accept untested hypotheses. There are no studies that document that increased edge effects in Douglas-fir forests results in invasion of species, such as cowbirds, that might parasitize spotted owl nests. For one thing, cowbirds nest much later than do spotted owls. Secondly, studies that attempted to prove that great-horned owls increase due to such edge effects were unsuccessful (e.g., Johnson 1990, unpubl. M.S. Thesis, Oregon State University). The same is true for effects of barred owls; they use dense forests and also may be impacted by extensive timber harvesting.

Reply - Neither the ISC or the EIS suggested that cowbirds might parasitize spotted owl nests. However, based on the scientific literature, it is logical to conclude that there are possible deleterious effects of increased habitat edges. For further information on edge effect, the FEIS referred the reader back to the ISC Report (page 274), which provides examples and references on edge effect. Further, the FEIS cited the recent work by Carey et al. (Appendix D - 18), that discusses the influence of fragmentation on spotted owls.

[*N92] Also, the alleged effects of microclimate cannot be considered significant until evidence suggests that there is indeed an effect. Certainly, microclimate is indeed changed, extending a few hundred feet into stands--that's a fact. No information has been produced that indicates that there is any effect on the owl. In fact, edge effects might well produce a positive effect in many areas. For example, snowshoe hares are well known inhabitants of forest edges, and they are important prey for spotted owls. The same is true of woodrats; there is good evidence that owls in the Klamath province may be responding positively to dusky-footed woodrats along forest/brushy clearcut edges. In fact, Solis (1983, M.S. Thesis, Humboldt State University, Arcata, CA) found that 26% of the locations of radio-tracked spotted owls were along edges. The final EIS should be more careful in accepting hypotheses that have not been tested, and point out all the possible consequences of edge effects, including possible beneficial effects where they might occur.

Reply - This issue is addressed in the reply to *N91 above. Further, the EIS team is not aware of studies documenting the effects of edge-related microclimatic change on spotted owls. Biologists have speculated that warmer,

drier conditions associated with high-contrast edges may create less favorable conditions for growth of fungi that may be important as food for small mammals that, in turn, are prey of spotted owls. It is conceivable then, that edge conditions may reduce habitat quality for spotted owls. However, such a scenario is speculative.

[*N93] Page 3&4-27: AREAS OF CONCERN

The spotted owl population on the Olympic Peninsula may be isolated demographically, but not genetically. Several pieces of evidence documents successful dispersal of owls through the Puget lowlands to the Olympic Peninsula, probably sufficient to maintain genetic variability. Thus, the salient question to be answered for the Olympic Peninsula population is, "What is the likelihood for persistence for the Olympic population, given that there are probably more than 150 pairs of owls?" Data presented in the ISC report suggest that an interbreeding population of more than 20 pairs would enjoy a very long time for persistence.

Reply - The ISC Report suggests that 20 pair HCAs would enjoy persistence IF they were interconnected with other HCAs. The ISC Report states on page 286: "Empirical data and theoretical modeling indicate, however, that habitat blocks with as few as 15 to 20 pairs have a relatively low probability ofinking out (see appendix M). We believe this low probability would hold for a system that includes many such habitat blocks separated by distances and connected by habitat features consistent with the known dispersal tendencies and capabilities of the target species (see appendix P). Indeed, we believe that such an arrangement of large habitat blocks probably functions more like a single, interacting population, than as isolated subpopulations."

Regarding commenters "salient question", although the FEIS did not provide viability ratings for individual provinces, analysis results for each province are provided. The overall rating for the preferred alternative is HIGH. This rating was based in part on analyses for the Olympic Peninsula (FEIS 3&4 51-100).

This issue is also addressed in the reply to *N42 above.

[*N94] Page 3&4-29: POPULATION STRUCTURE

If spotted owls are effective at maintaining territories, one wonders just how packing is manifest. The final EIS should provide literature references that verify that predatory birds suffer effects due to packing. If habitat loss temporarily results in increased densities of owl pairs (i.e., packing), then increased adult and juvenile mortality might be the expected result. Information may already exist to test this phenomenon. Because the hypothesis has been oft-repeated, we find it incredulous that the biologists involved have not collected data so as to make the test.

Reply - The discussion on packing was based on analysis of empirical data (Thomas et al. 1990: 236 and 278). However, this hypothesis does warrant further review and will be considered as part of the research and monitoring program.

[*N95] Page 3&4-35: POPULATION VIABILITY

We suggest that the final EIS be careful about making generalized statements. An old adage holds that all generalizations are false:

variation is common in nature. The statement is made that a "specialist" animal species may be affected more by changes in habitat than a generalist. This is widely accepted by ecologists. The implication here is the notion that northern spotted owls may be specialists, both in habitat occupied and prey exploited.

Reply - The habitat relationships of spotted owls have been the focus of numerous research studies. While much remains to be learned about spotted owls, there is a great deal of scientifically based empirical data. The best available information was used in the EIS. The EIS incorporated the ISC by reference which was an exhaustive review of spotted owl literature. Further, the EIS considered additional information that became available since the ISC was published (FEIS Bibliography 1-11, and Appendix D). Further, see the reply to *N97 below.

[*N96] Actually, there is evidence that the owl may be a relative specialist when it is restricted to old-growth forest (such as that on the Olympic Peninsula, Washington), but may be a relative generalist in other situations. On the west side of the Olympic Peninsula spotted owls exploit a rather limited set of prey species. Under those conditions, the owl population breeds infrequently; available evidence from Forest Service studies is consistent with the hypothesis that reproductive success among owls fluctuates with densities of flying squirrels. On the east side of the Cascades, the owl population breeds more consistently, and, probably not coincidentally, exploits a much wider prey base (Richards 1989, M.S. Thesis, Colorado St. Univ., Ft. Collins). Possibly, the more diverse prey base allows more consistent reproduction in a forest where the owl can be a relative "generalist".

Reply - This issue is addressed in the replies to *N39 and *N95 above.

[*N97] This situation appears to exist in several areas of the owl's distribution. This may be noteworthy, because some of those forests have historically been subject to much more frequent small-scale disturbance than forests on the Olympic Peninsula, including timber harvesting in the past. Therefore, one wonders whether or not the owl should properly be labelled as a specialist or a generalist.

Reply - Whether spotted owls are labeled as specialists or generalists is not an issue. The issue that must be addressed is "what are the habitat relationships of spotted owls?". This issue is explored and documented in the scientific literature that is the basis for the analysis in the ISC and EIS (see ISC Report Appendix F, and FEIS 3&4 11-32).

[*N98] The salient point here is that wildlife populations depend upon energy and nutrients that are available for survival and reproduction. In the case of the spotted owl population in old-growth forests, energy and nutrients are primarily available in the form of flying squirrels. In turn, the flying squirrels get a significant amount of their energy and nutrients from a single biochemical pathway: nitrogen and energy via fungi and breakdown of dead wood. In mixed forests such as on the eastside of the Cascades, apparently several pathways of energy and nutrient flow are available, such that the owl exploits a variety of sources.

Reply - This issue is addressed in the replies to *N95 above.

[*N99] The statement is made, "The alternatives do not call for direct manipulation of population demographic or genetic conditions, prey abundance, occurrence of other species, or other factors external to the forest habitat." We suggest that the final DEIS consider assessing the potential value of indirect manipulation of habitat to increase prey populations. Several habitat modifications, for example, commercial thinning in extremely dense young forest stands, could result in increased prey populations. Other modifications could result in increased availability of prey populations (such as understory control). We encourage the EIS team to consider the costs and benefits of active, purposeful management of prey species and their habitats, as opposed to a passive, "leave things to Mother Nature" approach.

Reply - This issue is addressed in the to *N19 above. This concern is also addressed in the reply to *N60 above.

[*N100] Page 3&4-37: POPULATION SIZE IN RELATION TO AMOUNT AND DISTRIBUTION OF HABITAT

The comparison of randomly sampled, 1000-acre areas with greater than 500 acres of habitat with randomly sampled 1000-acre areas with less than 500 acres of habitat. The percentage of occupancy by spotted owls was found to be statistically significantly higher in randomly sampled areas with more than 500 acres of habitat. The ISC failed to report the coefficient of determination, which indicates the relative amount of variation that is "explained" or accounted for by the analytical model. A re-analysis of the data contained in the ISC report shows that less than 10% of the variance in occupancy is accounted for, suggesting that (a) the statistical relationship is real but weak (i.e., there are factors other than habitat that influence occupancy by owls; or (b) suitable habitat was poorly defined. We suggest that the final EIS carefully report the full extent of statistical analyses, and note that a significant statistical correlation does not necessarily mean a cause and effect relationship.

Reply - The ISC Report appropriately presented the interpretation of results in terms of probabilities. Further, this issue is addressed in the response to the first comment on page L-A-24 of the FEIS which states: "The Interagency Scientific Committee interpreted the data with recognition to uncertainties and assumptions. Assumptions must be made with any modeling effort. The best available empirical data was reviewed by the committee and uncertainties pertaining to the models were clearly identified in Appendix M. of the ISC Report (Thomas et al. 1990). The viability ratings; HIGH, MEDIUM, and LOW, account for degrees of uncertainty.

"Further, while quantitative analytical methods were used in the ISC Report, and in this EIS, these were not the only methods used to assess population viability. Professional judgement was relied upon after review of the best available empirical data. Therefore, any potential problems with the modeling effort is expected to be minimal.

"Monitoring, research and the Spotted Owl Recovery Plan, which is expected to be released this year, will provide information to test these assumptions thereby providing information necessary for adaptive management. Additional

precautions will be provided by the project level consultation with U. S. Fish and Wildlife Service on actions that affect spotted owls and their habitat."

[*N101] Also on Page 3&4-37, the DEIS mentions the Bart and Forsman paper that compared owl densities in relatively homogeneous 50-80 year-old forests with those in extensive old-growth forests. Unfortunately, Bart and Forsman generally excluded surveys from young forests that contained scattered patches and individual large trees, as would occur in forests managed by partial harvesting practices. In fact, for the only area that did include such forests, the McKenzie River district in western Oregon, they reported an outdated figure for density. Miller et al. (1991) examined owls in those forests, and found densities that were greater than reported for the same area by Bart and Forsman and greater than expected according to the limited amount of older forest present (<10%). Furthermore, the owl densities in that area are incompletely surveyed, and could be higher.

Reply - This issue is addressed in the reply to *N73 above

[*N102] The information in Miller et al (1991) suggests that habitat structure has a greater effect on owl occupancy than does forest age. Knowledge of the forestry practices that created those forest conditions could provide the basis for forest management plans that provide for the owl in managed forests.

Reply - This issue is addressed in the reply to *N73 above

[*N103] Page 3&4-40-44: POTENTIAL CHANGE OF HABITAT AMOUNTS
The DEIS does not make clear how the potential changes in habitat were quantified. We suspect that the DEIS team was forced, by the short time to complete their work, to use maps of suitable habitat that had not been upgraded--new information on habitat use has been collected since 1989. If the Forest Service DEIS team did not use updated maps of suitable habitat for making such projections of viability, then potential changes in habitat, especially that which will grow into suitable condition in the relatively near future, are likely to be severely underestimated. Thus, it would be helpful in the final EIS to show, by alternative and by province, acreage of forests expected to become suitable in the future as well as that in reserved status. Similarly, the rates of change in habitat should be graphed over time.

Reply - Methods used to calculate owl habitat projections are discussed in Appendix B of the FEIS. Current, predicted future amounts and rate of change of owl habitat are displayed in the FEIS viability analysis, criterion 1.

[*N104] Distribution of nesting, roosting, and foraging habitat are stated as being distributed throughout the range of the owl--again, we wonder if updated maps were used.

Reply - This issue is addressed in the reply to *N73 above. In addition, data compilation is discussed in Appendix B. Evaluation and mapping of northern spotted owl nesting, roosting and foraging habitat at the forest level is discussed in the FEIS chapter 3&4 - 14.

[*N105] Page 3&4-59: CRITERION 3 NUMBER OF OWLS

This section excludes the owl pairs on National Park Service lands on the Olympic Peninsula. The ISC estimated that 131 pairs of owls currently occupy the HCA they designated for the Olympic Peninsula; and that estimate may be conservative, because the ISC was working with outdated maps of suitable habitat, and because the Park has scarcely been inventoried for owls. We suggest that the final EIS contain full disclosure of the likely numbers of owl pairs in protected areas, SOHAs, and HCAs for the Olympic Peninsula for each alternative. The ISC pointed out that a population of 11-15 interbreeding pairs of owls would be expected to persist for several decades. This information doesn't seem to be emphasized in the DEIS.

Reply - The habitat capability estimates and the number of clusters for the Olympic Peninsula are displayed in Chapter 3&4 on page 3&4-75 and pages 3&4-88 through 3&4-90 of the FEIS. This issue is also addressed in part in the response to the second comment on page L-A-39 of the FEIS which states: "The population estimates in the ISC Strategy included all known and expected northern spotted owl pairs in Wilderness and National Parks within HCAs. The analysis of habitat capability in this environmental impact statement also includes habitat within Wilderness."

[*N106] Page 3&4-67: CRITERION 6 PATCH SIZE

We are aware of only 2 accounts of studies that attempted to examine patch-size relationships for northern spotted owls. Meyer et al. (1990) found a positive correlation between occupancy of sites by owl pairs and stand size of old-growth forests, and Rosenberg and Raphael (1986) found that calling responses by spotted owls to tape-recorded calls increased with stand size up to about 50 acres. It is not apparent that the DEIS authors used either Meyer et al. (1990) or Rosenberg and Raphael (1986) for estimates of patch-size effects.

Reply - This issue is addressed in the first paragraph of the response to the second comment on page L-A-26 of the FEIS which is presented in the reply to *N71 above. A draft report of Meyer et al. (1990) was reviewed and is included in the unpublished section of Appendix D (D-22 of FEIS). Rosenberg and Raphael (1986) was reviewed by the ISC and is cited in Thomas et al., (1990: 214).

[*N107] Page 3&4-71: OVERALL VIABILITY RATINGS

We find enlightening the rapid evolution in consensus opinion among biologists and scientists relative to management of northern spotted owls. Until 1990, the SOHA system was touted as the way to achieve long term viability. That proposal was discarded by the ISC, primarily on the basis of perception, rather than biological data. Currently, the ISC system of HCAs comprises a "working hypothesis."

Reply - This issue is addressed in the reply to *N22 above.

[*N108] We make that note simply to point out that we hope that final determinations and land allocations are made on the basis of solid experimental evidence, rather than perception and hypotheses that have been accepted without testing. At the very least, we urge the EIS team to acknowledge the huge gap of scientific uncertainty relative to the owl population and how to manage it. More importantly, we encourage the EIS

team to consider an alternative that would simultaneously implement more than 1 working hypothesis, or at least several options within an alternative, recognizing that doing so provides the greatest opportunity for management policies that are tailored to the conditions found within each physiographic province.

Reply - This issue is addressed in the reply to *N100 above.

Further, incomplete or unavailable information is acknowledged and discussed on the first page of chapter 3&4. The preferred alternative does encourage continued research and monitoring programs and an adjustment process to incorporate new information.

[*N109] Alternative A (clusters of habitat sufficient for up to 3 pairs of owls, spaced not more than 12 miles apart, and distributed in a network across the species' range) may well provide for a relatively low likelihood for long term persistence, but for different reasons than specified in the DEIS. The primary problem with the SOHA system is low numbers per cluster, not distribution; furthermore, SOHAs were designed by biologists to account, as well as possible, for alleged effects from fragmentation.

Reply - This issue is addressed in the response to the first comment on page L-A-33 of the FEIS which states: "Based on spotted owl viability analysis in this document, Alternative A, which reflects current Forest Plan and Regional Guide direction, would result in a LOW likelihood of viability for northern spotted owls and thus would not ensure viable populations. The definition of low viability and the reasons why Alternative A was rated LOW in this analysis are discussed in the viability sections of Chapter 3&4."

Other concerns in addition to low numbers per cluster discussed in chapter 3&4 Overall Rating section for Alternative A include: reduced habitat capability, low occupancy of SOHAs, low probability of recolonization of vacant SOHAs, no provision for young forest to grow into owl habitat, increase in forest fragmentation, no provision for dispersal habitat, no provision to improve habitat conditions in areas of concern, limited provisions for resolving catastrophic loss of habitat and decreasing population sizes to the point of likelihood of localized extinctions.

In addition, the SOHA network was established using current owl habitat with no provision to grow owl habitat to reduce fragmentation.

[*N110] First, the SOHA alternative would provide for a rather well-distributed population, which meets the "well-distributed" part of the NFMA regulations. However, the cluster size was viewed by the ISC as too small relative to distance between SOHAs (12 miles), such that probability for long term persistence was likely to be low.

Reply - Distribution of spotted owls and spotted owl habitat under Alternative A is discussed in the FEIS chapter 3&4 - 95. Specifically, decline in pair occupancy of small designated areas, increased fragmentation, degrading habitat quality associated with blowdown along forest edges, no provision for dispersal or movement habitat, decline in successful recolonization, no provision for improving habitat conditions in areas of concern, limited provisions for resolving catastrophic loss of habitat and effects these habitat conditions

would have on well distributed owl populations were concerns of Alternative A. This concern is also addressed in the reply to *N109 above.

[*N111] Second, the EIS team must recognize that the system of SOHAs would actually include more than an even distribution of clusters of 3 pairs. The team must determine the probability of long term persistence that would be made by SOHAs in a landscape that also includes some relatively large clusters of owl pairs that occur in Wilderness areas, Olympic National Park, and in areas that are set aside through administrative action (e.g., roadless areas, scenic areas, etc.). The bolstering of the SOHA owl clusters that arises from such entities should be acknowledged and quantified.

Reply - Only areas large enough to support five or more pairs of spotted owls were analyzed as a cluster for criterion 7 as discussed in the FEIS chapter 3&4 - 87 (citing Voss and Noon in Thomas et al. (1990: Appendix Q)). This concern is also addressed in the reply to *N109 above.

[*N112] Third, the DEIS suggests that habitat within SOHAs would occur in small, discontinuous patches, which is not necessarily true. The SOHAs were designed by biologists to occur in patches of suitable habitat that were as contiguous as possible, and over time, regrowth would decrease the potential effects of current fragmentation. Further, the habitats for 3 pairs of owls were to be concentrated so as not to be more than 1.5 miles apart, edge to edge. Therefore, the alleged problems with distribution and fragmentation, while potentially real, may well have not been as severe as indicated by the DEIS.

Reply - This issue is addressed in the third paragraph of the reply to *N109 above. In addition, the amount of habitat in SOHAs is less than that used by owl pairs observed in field studies and occupancy rates of SOHAs is expected to be low.

[*N113] Even the ISC employed some aspects of the SOHA system, in recommending Category 2 and Category 3 HCAs. Therefore, it seem highly possible that the DEIS team could have developed a Modified SOHA Alternative, that contained some of the salient elements of the SOHA proposal and other proposals. Such a Modified SOHA Alternative might include various sizes of habitats in relation to distance from large population clusters within wilderness and National Parks. For example, SOHAs could include 3 pairs if they are within 5 miles of a larger population but be set for 6 or more pairs if they are 10 miles from a larger population. Such a modified alternative may well have enjoyed greater attention and resulted in higher level of likelihood for long term population persistence.

Reply - The ISC Committee developed standards and guidelines for the size of HCAs and distances between HCAs needed to ensure long-term viability of northern spotted owls based on the best available empirical data. The EIS analysis, aimed at developing alternatives that met the purpose and need of ensuring viability of the northern spotted owl, indicated that such an approach would not ensure viability.

[*N114] Finally, we urge the EIS team to consider developing an alternative that applies more of the available information on spotted owls, to include that which suggests forestry practices that should work to maintain the owl. Strong evidence exists to indicate that owl habitat can be "rotated" over time and space through a drainage so as to maintain the owls. The evidence for such an alternative is strongest for mixed conifer and evergreen hardwood forests and for the coastal redwood zone. Developing such an alternative is more complicated, and requires allowance of forest districts to develop specific management plans based upon local conditions.

Reply - This issue is addressed in the response to the third comment on page L-A-29 of the FEIS which is included in the reply to *N19 above.

Further, this issue is also addressed in the response to the first comment of page L-A-30 of the FEIS which states: "Ongoing studies might help clarify spotted owl habitat use and characteristics in second-growth forests. Most second-growth forests used by spotted owls appear to contain structural characteristics of older forests. Both the ISC Report and this EIS acknowledged these studies. Most of the information is still in the form of unpublished reports that have not been peer reviewed. Peer review is an essential step in the process that determines scientific credibility of methods and analyses.

"Much of the information on spotted owl habitat use that has recently surfaced is based on increased survey efforts in a wider variety of habitats than previously inventoried. Although spotted owls may occur in relatively young forests (80 years old), the reproductive success over the long term in such forests has not yet been established. The known number of reproductive owls in young forests is a small percentage of the number known to nest successfully in mature and old-growth forests. Understanding the specific attributes of forests that may support successful reproduction is a research priority. As the result of research accumulate, definitions of habitat use by spotted owls will likely change."

[*N115] We recognize that such an alternative includes identifying two kinds of risk: biological risk and decision-making (management) risk. The latter risk would require assessing the risk that technological developments (innovative forestry practices) would fail to produce satisfactory owl habitats in managed forests. While it is possible that a "management alternative" would result in some landscapes where owl populations exhibit reduced densities, the evaluation would require a cumulative analysis of separate contributions to viability made by owls in reserved areas and managed areas.

Reply - Reserved areas are included as part of Alternative A which rated low. Reserved areas alone would not provide a higher rating, but can only contribute to a well-developed plan with a HIGH probability of ensuring viability throughout the range of the northern spotted owl which is the required task of this EIS.

[*N116] Page 3&4-91: PACIFIC YEW

From our analysis it appears that a substantial portion of known information was not included in the discussion of spotted owl alternative impacts to the Pacific Yew. Certainly the Federal Register Notice decision

by U.S. Fish and Wildlife Service (USF/WS) conclusion not to list the Pacific Yew as a threatened species could have provided a multitude of information.

Reply - A "substantial portion of known information was not included" because:
a. Management of Pacific yew is outside the scope of this EIS; b. Future Management of Pacific yew is the subject of a separate environmental impact statement currently being developed, and; c. Enough information was included in the FEIS for the decision-maker to make a reasoned decision. Several sources of information were consulted including the Forest Service's, "A Response to the Petition to List Pacific Yew as a Threatened Species", which was the major source document for at least the Forest Service portion of the notice to which you refer.

[*N117] The DEIS has incorrectly stated that genetic viability and diversity of the Pacific Yew is tied to the amount of late-successional stage forests". The DEIS has failed to recognize a major finding by Jimerson and Scher (submitted for publication). Their work while listing stand age as an element, clearly drew the conclusion that age alone is not a sufficient determinant for Pacific Yew habitat. Their work concluded that the major determinants include: proximity to water, slope position, vegetative cover and elevation.

Reply - The citation notwithstanding, Appendix I of the FEIS includes: "Pacific yew is closely associated with late-successional forests...", and "Those alternatives that provide for a functional, late-successional forest network would best maintain the genetic and ecological viability of Pacific yew." The description of habitat in the FEIS is not as exclusionary as suggested in the comment. For example: yew "...is affected by management activities in its habitat, INCLUDING the amount of old-growth habitat harvested, the amount of old-growth habitat set aside or remaining in a protected allocation, and the amount of yew trees harvested for taxol." (emphasis added), and; "The Pacific yew is....in riparian areas because of infrequent fire history". Further, the EIS conclusion that timber harvest affects yew is qualified with "This is assuming that timber harvest itself will reduce population of Pacific yew by reducing this surrounding old-growth habitat." Taken as a whole, the relationship between yew and late-successional stage forests expressed in the EIS is a correct one. (FEIS I-1-3)

[*N118] The USF&WS correctly points out that Pacific Yew is present in a wide variety of habitat conditions. In fact, the Service found, "Because a substantial portion, if not most of the remaining yew trees likely occur in the more abundant young/serial forests, the greater densities and frequencies of the yew in old growth stands do not substantiate the assertion by the petition (to list the Pacific Yew) that the long term survival of the yew is ultimately linked to ancient forests."

Reply - The EIS does not assume that long term survival of the yew is ultimately linked to ancient forests, but that removal of such forests affects the probability of maintaining the genetic viability and diversity of yew.

[*N119] The DEIS fails to support claims that suggest Alternative A would have the lowest probability of maintaining the genetic and ecological viability of Pacific Yew in its range. The Forest Service has not done a

thorough effort in assigning a risk to pacific yew. The Agencies own guidelines seem prepared to maintain future genetic/ecological value by requiring high-stumping of yew trees. This promotes sprouting therefore providing maintenance of individual trees long into the future.

Reply - We have reviewed the discussion of impacts to Pacific yew in the EIS and find them to be correctly stated for the various alternatives and for the habitat relationships cited and described.

[*N120] According to the USF&WS it is estimated that 130,000,000 yews trees exist. Applying the expected harvests over the next 7 years, the total impact of yew harvest may reach .4% of the present inventory. This could hardly be considered a measurable impact let alone assigning a risk for a given alternative. Even if we accepted the Forest Service's number for yew population at 29,000,000 the total harvest would be less than 2% of the total inventory.

Reply - The risk cited in the EIS to maintaining genetic viability and diversity of yew is not based upon the expected harvest of yew trees for taxol production (the source of the numbers cited in this comment), but upon the ways the various alternatives will affect late-successional forests.

[*N121] We agree with the DEIS that the same factors expected to eliminate or severely restrict commercial timber harvesting will also impact the level of Pacific Yew harvested. Although the DEIS mentions that the majority of the taxol supply will come from the harvest of Pacific Yew in National Forests, it may be valuable to extend the impacts to the medical research and cancer treatment.

Reply - Given that the overall management of Pacific yew is outside the scope of this EIS, the relatively brief treatment of yew in the EIS is adequate for the decision-maker to make a reasoned choice from among the alternatives.

[*N122] Page 3&4-92: INSECTS AND DISEASES

We agree with the DEIS that without preventative treatments, insect and disease effects alone or in combination with effects of wildfire will seriously degrade spotted owl habitat and eliminate suitable habitat altogether in others. Much of Oregon's eastern forests have been under siege from a variety of pests and pathogens. While several factors have contributed to the present decline persistent drought and limited treatment of insect outbreaks has created forest conditions that have little protection from insect and disease.

Reply - The fire protection-related shift to shade tolerant species is significantly more responsible for eastern Oregon's current insect conditions than "limited treatment".

[*N123] The DEIS was correct in stating that spotted owl habitat may be in jeopardy without some form of treatment. This alone should signal the need for development of management that can effectively maintain structural needs for the owl and reduce impacts from insect/disease. Unfortunately no discussion was ever included to respond to these problems.

Reply - This issue is addressed in the response to the second comment on page L-A-56 of the FEIS which states: "The FEIS documents the current conditions of insect and disease complexes and describes potential effects if preventative treatments are not implemented. Each of the alternatives propose a process for evaluation and implementation of treatments for insects and diseases which would promote long-term maintenance, development, or enhancement of spotted owl habitat." The ISC Report, Page 31, for instance, applicable to alternatives B, C, and D, states: "Management plans will be needed for each HCA to evaluate their vulnerability to fire, windstorms, and damage from insects and diseases." Also a portion of the response to the second comment on page L-A-47 of the FEIS addresses this subject when giving possible examples of silvicultural treatments which "...may be approved early.. (include)..treatments of...stands prone to catastrophic insect and/or disease outbreaks."

[*N124] Page 3&4-94: FIRE AND FUELS MANAGEMENT

We agree with the DEIS that the alternatives with greater owl protection will also greatly intensify the opportunities for catastrophic fires. There is no question that limitations imposed on road building, commercial harvest of trees, and slash treatment will be a negative effect of spotted owl habitat preservation. Recent fires in the Willamette National Forest clearly indicate the difficulty in protecting land whether in a managed or un-managed condition.

Reply - The FEIS, page F-4, states the opportunities for catastrophic fire will increase "...if no management activities are employed to reduce fuel buildup", a situation that could be reversed "...if measures are taken to protect designated areas...". We assume the second sentence of the comment was intended to mean "relative to catastrophic fires" only.

[*N125] Page 3&4-116: WATER QUALITY AND FISH HABITAT

The DEIS presentation of Water Quality and Fish Habitat relationships is misleading and in need of significant revision. While concerns about Water Quality and Fish Habitat play a subservient role in the immediate decision related to the management of the Northern Spotted Owl, information contained in an EIS must still strive to be accurate and whole in its presentation.

Reply - It is correct that an EIS should strive to be accurate and whole in its presentation; this EIS is accurate and complete.

[*N126] From the very onset of this section, a far too simplistic approach is adopted which misleads both the public and the decision-maker into thinking that fish habitat/water quality and commercial human endeavors are mutually exclusive. It is further inferred, under the guise of decreased "risk" to watersheds, that water and fish resources become necessarily enhanced under Alternatives which set aside higher amounts of land. NFRC flatly rejects this portrayal for the following reasons.

Reply - The FEIS is intended to only discuss potential effects on water quality and fish habitat from implementation of a strategy for management of spotted owls on National Forests, generally by establishing standards and guidelines for managing owl habitat. In this sense, potential effects on water temperature and sedimentation are likely to be the same for both water quality

and fish habitat. Lesser amounts of areas disturbed by an alternative therefore will likely also provide more stable water temperatures and less sedimentation. The EIS does not imply that by reducing ground disturbing activities alone that water quality and fish habitat would be enhanced, but that current quality would be maintained and less risk of degrading these resources would be present.

This series of comments (*N126-*N149) dealing with water quality and fish habitat points out specific situations which may be exceptions to the general pattern of environmental consequences described in the EIS. Without debating the validity of this specific observations made by the NFRC, none of them offer substantial ground for reversing or revising statements about the general environmental consequences presented in the EIS. This EIS discloses the environmental consequences of a management program of wide geographic scope; exceptions to and refinements of predicted environmental effects are to be expected in specific locations and situations. This is why the consequences are described in general terms, and often use the language of probability rather than certainty.

Further, the issue of water quality is also addressed in the reply to the first response on page L-A-66 of the FEIS which is presented in reply to *N25.

Also, this issue is addressed in the reply to the second comment on page L-A-66 of the FEIS which states: "This subject is addressed in the standards and guidelines for each individual Forest Land and Resource Management Plan."

[*N127] The combined classification of water quality and fish habitat as related or synonymous issues is misplaced. In addition, the allegation that both water quality and fish habitat will necessarily become enhanced from increasing land set asides is far too simplistic.

Reply - This issue is addressed in the reply to *N126 above.

[*N128] Water quality and fish habitat are issues which should stand separately in the EIS discussion because the ultimate objectives pertaining to these resources often differ and sometimes conflict. Management's responsibility, rather than being singularly focused on pitting one resource against another in order to portray resource trade-offs, is to consider and define objectives and harmoniously meld them together. In addition, provisions for municipal drinking water and fish habitat are often found to be more in conflict than portrayed in the DEIS representation that high water quality necessarily equates to high fish habitat. For example consider Portland, Oregon's Bull Run Watershed. The water quality serviced to Portland's residents is proclaimed as being the highest quality in the nation. In study after repeated study, it has been shown that this water quality has been maintained, through time, with absolutely no adverse impact from carefully conducted timber harvest operations. However, Bull Run Reservoir must be recognized as consisting of a dam that is impenetrable to anadromous fish passage. As the DEIS suggests, consideration of fish populations have not become focused on individual stocks of anadromous fish. In this particular case, providing Portland's drinking water from Bull Run watershed has likely come at the expense of extirpating several fish stocks from the area. Considering that Portland is currently pursuing planning efforts to create yet another

reservoir (Burnt Alder), the issue remains current. This should be considered in the EIS portrayal.

Reply - This issue is addressed in the reply to *N126 above.

[*N129] Furthermore, water quality concerns typically focus only on providing high quality water to the input end of municipal water sources. What happens to this water once it re-enters the system, and most importantly, what is the condition and quality of that water once it is returned to aquatic habitat. Quite simply, the environmental effect of returned water to the environment is fully ignored in the DEIS. In addition, Portland is currently attempting to address its repeated dumping of untreated water back into the Willamette River. What is the environmental effect of this untreated water entering the system. If not a direct effect, dumping of untreated water certainly would fit into the indirect or cumulative effects which are germane to the EIS discussion. The DEIS errantly ignores considerations of these cumulative effects which constitutes a violation of NEPA.

Reply - This issue is addressed in the reply to *N126 above.

[*N130] It should also be recognized that the highest water quality for drinking purposes is probably too cold and too devoid of micro-life to support high fish biomass production. Thus high quality drinking water, as it pertains to optimum fish "habitat" is unlikely to be as nearly synonymous as is presented in the DEIS. In addition, the DEIS depiction of the relationship between high quality waters flowing from "pristine" areas (such as wilderness, unroaded and reserved areas) versus poor water quality and habitat conditions in "highly impacted areas" accomplishes more confusion than clarity in the DEIS discussion. The portrayal is little more than rhetoric which provides little to aid the public or the decision-maker in attempting to balance, integrate, define acceptable limits, or even understand the important operational relationships in effect. Quite likely, it is the management practices employed, rather than "timber harvest" per se, which has typically generated either the positive or negative influences on water quality or fish habitat.

Reply - Management practices that affect spotted owls or spotted owl habitat might indeed affect water quality and fish habitat to varying degrees. Still less risk of degrading these resources by increasing sedimentation and fluctuating water temperatures is provided by reducing ground disturbing activities. This concern is also addressed in the reply to *N126 above.

[*N131] The DEIS also appears to imply that a relationship exists between land use (such as the amount of suitable timber land) and the presence of in-stream large woody debris. NFRC submits that this characterization is misplaced, lacks perspective, and should be revised to more correctly identify the factors affecting large woody debris.

Reply - This issue is addressed in the reply to *N126 above.

[*N132] Past management practices, rather than the area which comprises the suitable timberland base per se, have had a significant impact on large woody debris and "habitat complexity". While the DEIS refers to past

activities "such as removal of woody debris", it entirely fails to portray and consider the following crucial aspects of this previous program:

Reply - This issue is addressed in the reply to *N126 above.

[*N133] 1) The woody debris removal program was a deliberate and intentional program spearheaded by several federal agencies (including the Forest Service) as well as State entities, such as the Oregon Department of Fish and Wildlife.

Reply - This issue is addressed in the reply to *N126 above.

[*N134] 2) The program was based on environmental concerns, at significant economic expense, for the perceived purpose of ameliorating channel scour (by removing one of the primary scouring agents i.e., large woody debris) and to prevent subsequent accumulations from blocking anadromous fish passage. With the findings that fine woody debris can deplete dissolved oxygen content in streams, compliance with the program entailed removing the debris by hand with pitchforks and rakes.

Reply - This issue is addressed in the reply to *N126 above.

[*N135] 3) Germane to this entire EIS, the woody debris removal program was based on the Best Science of the day, and

Reply - This issue is addressed in the reply to *N126 above.

[*N136] 4) (U)nlike practices occurring on private timberlands, the most rigorous depletion of in-stream woody debris occurred on Forest Service lands via a new found enthusiasm of environmental concern via rigorous enforcement of standards and contract provisions.

Reply - This issue is addressed in the reply to *N126 above.

[*N137] In this fashion, large woody debris, now recognized as an important component of fish habitat, has decreased in many areas on National Forest lands. The problem was not that these areas were logged, or that the lands in general were part of the suitable landbase for timber production. The problem was particular to the management practices so vigorously enforced by agencies such as the USFS. In addition, what is apparently most needed now is a return of woody debris to those areas via fish habitat enhancement projects by the active reintroduction of debris back into the system. In the particular case of fish enhancement, the DEIS notes that fish habitat enhancement may be delayed or possibly even canceled in designated spotted owl management areas (DEIS 3&4 - 119). From this standpoint, a negative relationship evolves between fisheries habitat improvement with increasing acreage designated for spotted owl habitat.

Reply - This issue is addressed in the reply to *N126 above. A proposed fish habitat improvement project would be reviewed through the appropriate process.

[*N138] The most cost effective and efficient time to restore large woody debris into a stream is during an active logging operations. This can be accomplished either by directional felling or intentional transport of wood

back into the stream. Once again, fisheries enhancement opportunities would appear to be cumulatively adversely affected by the increase of lands designated as spotted owl habitat. Finally, the DEIS posture of increasing road closures in designated habitat would have a negative cumulative effect on overall survey efforts and enhancement projects simply because more effort would have to be expended accessing the sites. In consideration of fixed time, energy, and funding levels in which the agency must operate, road closure cannot so simply be considered solely as a benefit to fish or their habitat.

Reply - This issue is addressed in the reply to *N126 above.

[*N139] What is most sorely needed in the DEIS discussion is an unbiased and honest assessment of management versus "natural" impacts and processes. No doubt, past management activities have induced negative effects upon watersheds and human error has been part of that process. Natural phenomenon and processes are not necessarily gentle when it comes to either fish habitat or water quality. Natural erosional processes, landslides, windstorms, volcanoes, floods and wildfire persist in this environment. What is needed in the DEIS discussion is a fair portrayal of both natural and man-induced processes. Most disturbing is the inference that natural erosional processes can either be ignored or that a 5,000 cubic yard natural landslide is somehow acceptable, while a management induced landslide of exactly the same intensity is not.

Reply - This issue is addressed in the reply to *N126 above.

[*N140] There are nagging similarities between past management practices which removed large woody debris and the current landslide "prevention" effort of the Agency. Already, the past intuitive belief that landslides necessarily equate to a negative effects on fish habitat is being challenged by observation. In certain situations, such as when stream systems are sediment poor (F. Everest-Knowles Creek Study on the Siuslaw National Forest) even so-call human induced landslides have resulted in net positive effects on fish and fish habitat. Such situations, partially influenced by past management on sandstone based geological formations, are presented on much of the coastal stream systems within the range of the spotted owl. In this case, highly dissected erosion prone lands combined with high rainfall events to produce a "need" for continual replenishment of spawning gravels and large woody debris. One of the most prominent sources of these course sediments comes from landslide activity. Landslides are the mechanism which move large woody debris from high order streams down into anadromous fish habitat. These same streams also comprise much of the anadromous fish habitats alluded to in the DEIS as having a "habitat problem". The very same intuitive thought process which generated past management's call to remove large woody debris appears markedly similar to the current theme represented in the DEIS that more land set aside for spotted owl habitat corresponds to improved fish habitat.

Reply - This issue is addressed in the reply to *N126 above.

[*N141] This troublesome theme also exudes into the Soils Section (DEIS 3&4 page 120). According to the DEIS, "Designated area managed primarily for

spotted owl habitat will provide added measures of protection to soil resources".

Reply - The EIS notes that soils are protected by management direction in the Regional Guides and Forest Plan standards and guidelines. The EIS also points out that designated areas will supply additional protection against the potential short-term negative effects of timber harvest, and lists what those are. While there is no question that catastrophic fire is detrimental to soils and therefore protection of HCAs from certain types of fire is desirable, it is unclear why the commenter would suggest that full multiple-use activities including timber harvest would actually be better for soils than the continuation of the more natural processes likely within HCAs. Although technically possible, little evidence supports this theory in practice.

[*N142] NFRC does not find this statement based in fact or supported by scientific study. NFRC argues that the management practices tend to influence protection much more than land allocation. Even to the degree that land allocation does influence protection of soils, the relationship of positive or negative is far less clear. For example, the DEIS notes in the Fire and Fuels Management Section (3&4-94) that the threat of large scale stand replacement fires increases in a direct relationship to the amount of land designated for spotted owl management. NFRC has a difficult time understanding how stand replacement wildfire can be considered as having a beneficial effect on soils. The relationship appears in total contradiction to the view that designation of spotted owl habitat necessarily provides "added measures of protection".

Reply - The benefits to soils of designating areas to be managed primarily for owl habitat, as noted in 141 above, are described in the EIS as "...will not be subject to the potential short-term effect of timber harvest" which "...may include displacement and mixing of soil horizons, soil compaction, and increased turbidity and sedimentation in streams due to soil erosion." The EIS further acknowledges "Some of this effect can be negated by the occurrence of intense wildfires." Nowhere does the EIS contain the "contradiction" suggested by the commenter.

[*N143] The DEIS states that "Large trees moderate water temperatures by shading streams" (DEIS 3&4 - 116). While this statement contains an element of truth, it is errant of oversimplification and broad omission. NFRC's raises objection to the inference made that only large trees produce shade, and that shading of streams is always necessarily "good" for fish habitat.

Reply - This issue is addressed in the reply to *N126 above.

[*N144] The oversimplification fails to recognize the positive effects of 1) small and medium size trees, 2) the sufficiency of brush buffers on small streams to moderate water temperatures, 3) the effects of topography and latitude on stream shading.

Reply - This issue is addressed in the reply to *N126 above.

[*N145] The oversimplification also erroneously infers that shading of streams is always necessarily "good" for fish or that stream temperature is currently too high or necessarily even binding on fish production throughout the range of the spotted owl. What the DEIS is attempting to depict is the effect of solar radiation upon the stream system. Unlike the DEIS portrayal, however, solar radiation is neither necessarily all bad, nor all good. Within a rather broad range, while solar radiation works to increase stream temperature, at the same time it also stimulates aquatic primary production, a feature which typically enhances overall fish biomass production. It is NFRC's stance, as well as that of the USFS in the Forest Plans, that BMP's and Standards and Guidelines ensure stream temperatures will fall within the acceptable range to fish. This being the case. NFRC suggests that increases in solar radiation under the protective standards of the Forest Plans would have generally positive effect on fish habitat and production. From this standpoint, the DEIS is in error by inferring a more positive relationship would result under the Alternatives which designate more habitat. While solar relationships on habitat become more complex with more site specific considerations such as latitude, topography, stream size, and the species of fish involved, to display the effects of solar radiation on fish by inferring that "the more shade the better" is just plain wrong.

Reply - This issue is addressed in the reply to *N126 above.

[*N146] While large trees can certainly play a role in shading streams, the relationship of fish production to the age of timber is simply non-existent. This should be stated succinctly in the EIS. Furthermore, the reference to the relationship of high quality waters to "pristine" areas (DEIS 3&4 - 116) must be reexamined. The statement too narrowly infers that high quality waters stem only from pristine areas. Such an inference perpetuates a myth inappropriate for the agency to foster, let alone consider, within a decision so important as that being considered within this particular DEIS.

Reply - This issue is addressed in the reply to *N126 above.

[*N147] While consideration of fish population levels and individual fish stocks is germane to a discussion of fish habitat, the DEIS is errant in failing to adequately address what is binding upon the reported decline of fish. While freshwater habitat is certainly an important aspect within the life cycle of anadromous fish, the greatest limitations do not appear to be freshwater habitat related. Quite simply, the primary concern related to low fish population levels consistently relates to low fish escapement (ie the decline in returning anadromous fish to freshwater spawning areas). In other words, current available fish habitat is under--utilized. Thus, the limitation of suitable freshwater habitat should fall into a least suspected category when considering the demise of fish populations. A multitude of more direct and menacing factors are present. These range from the interaction and competition of hatchery stocks with native stocks, to the most direct human impact on fisheries--the allowable annual commercial catch and recreational fishing.

Reply - The many factors that might affect fish populations are acknowledged and discussed in the FEIS chapter 3&4 - 154. Isolation of any one factor's

effect on populations is difficult. Discussion of all these factors is outside the scope of the FEIS. This issue is addressed in the reply to *N126 above.

[*N148] The presence of significant amounts of under--utilized habitat makes suspect hypotheses which offer that fish populations will increase if more freshwater habitat is protected. This is particularly true when dams, probably the most impacting negative influence on anadromous fish migration in freshwater habitat, are not present in the area. The latest freshwater "protection" hypothesis is found in the Scientific Panel on Late-Successional Ecosystems (Gang of Four Plus Two) Report alluded to in the DEIS. This report ascribes a very-low to low probability of maintaining viable populations of sensitive fish stocks under Alternatives A and B. Aside from the Report's failure to rectify the conflict between freshwater habitat "protectionism" in the presence of under utilized spawning habitat, the Report also contains several severe scientific limitations. For example, the Report fails to provide any detail on the construction of their viability assumptions and fails to establish or support the implied cause and effect relationships which are integral to the reports findings. The Report, while undeniably constructed by people held in high esteem, would have benefited significantly from peer review.

Reply - This report was commissioned by Congress, and therefore was outside the control of the Forest Service, and scope of the FEIS. The results of the report are displayed in the FEIS for informational purposes only.

[*N149] In summary, the vague generalities offered in the DEIS lead the reader to conclude that more land set aside for spotted owls will necessarily lead to improved fisheries. NFRC believes such a portrayal is erroneous from the onset and requires correction.

Reply - This issue is addressed in the reply to *N126 above.

[*N150] Page 3&4-120: Land Adjustment, Uses, and Permits
There is something essentially wrong with this section's overzealous interpretation of restrictions in spotted owl habitat. For the Forest Service to consider that a survey crew cutting brush in order to establish boundary lines "could possibly disturb nesting spotted owls" is ludicrous. To consider that private access across Forest Service designated spotted owl habitat constitutes a detrimental effect on habitat is a likewise overzealous position. Most new private access needs would be of relatively short length. However, if the position holds true that even these proposed roads are deleterious to spotted owls, then no intermingled ownership lands should be designated under any alternative.

Reply - The EIS comment regarding survey line clearing is consistent with Answer #6 in the second set of ISC-related Questions and Answers, dated January 4, 1991 and incorporated by reference into alternatives B, C, and D, which states: "Such activities as small hydroelectric projects, trail construction, campground construction, ski resorts, and rock pit expansion may or may not significantly affect the quality of owl habitat." The Forest Service has established an Oversight Team to review projects for consistency with the Standards and Guidelines if there is any question. Regarding the issue of private access, the issue is a complex one requiring USF&WS consultation and conformance with the Endangered Species Act (which also prevents a 'taking' on

private lands.) Further, the ISC Standards and Guidelines seek to avoid road construction within HCAs, particularly within one quarter mile of owl activity centers. HCAs designations tried to avoid private lands where possible, but the referenced language in the EIS also applies where the private parcels may be near an HCA as well.

[*N151] Of final note, mention is made of the ISC Strategy's requirement for an "interagency body organized to review implementation of the conservation strategy" (DEIS Appendix H-1). We were unable to find in the DEIS any other details of this interagency body, the body's guidelines, or the makeup of its members. It is paramount for the Forest Service, should it adopt any of the Alternatives tiered to the ISC Strategy (Alts., B, C, or D), to depict in the final decision how this body will be formed, what its guidelines are, and whether it will remain comprised of the current single disciplinary membership makeup or whether it will fulfill the agencies legal requirements to become interdisciplinary. NFRC believe it imperative that the ROD stipulate the nature and function of this committee.

Reply - Information on the interagency Technical Review Team and the interdisciplinary Forest Service Oversight Team is presented on pages 2-34 and 2-35 in the FEIS. The Record of Decision will address these groups and their function.

[*N152] Page 3&4-121: Mineral and Energy Resources

While the DEIS provides general information on Mineral and Energy Resources, the portrayal fails to adequately discuss the effects upon these resources. Furthermore, the economic assessment in the DEIS fails to divulge even a best guess of the economic impact stemming from restrictions on mineral and energy resources.

Reply - This issue is addressed in the response to the third comment on page L-A-69 of the FEIS which states: "See comment under "Timber" section of this appendix regarding "the lack of additional measures or management practices". This environmental impact statement displays which types of minerals entries would be likely to occur, along with estimates of the potential number and size of such activities. Management of surface resources on mining claims within the designated areas has always been and will continue to be subject to case-by-case evaluation. The guiding principle will be to avoid detrimental effects to spotted owl habitat wherever possible." The "Timber" response cited here discusses the case-by-case and other evaluation processes that would be used under alternative B. In short, the effects on mining and on owl habitat will be different for every situation. The EIS, however, provides an appropriate discussion of the magnitude and range of those effects relative to the alternatives.

[*N153] The reviewer is left with only a very generalized relationship that as the land designated for spotted owl habitat increases, a corresponding decrease in both availability and activity may occur related to mineral and energy resources. The DEIS infers this relationship will be created by either the outright withdrawal of lands from mineral entry and/or an increase in costs associated with additional mitigation measures.

Reply - This issue is addressed in the reply to *N152 above.

[*N154] The DEIS failure to sufficiently discuss and consider the direct, indirect, and cumulative effects of the alternatives on mineral and energy resources stand in violation of NEPA's full disclosure mandate. Despite the growing importance of mineral and energy development in the pacific northwest, mining and energy resources are given especially short shrift in the DEIS. NFRC finds no specific impacts or guidelines provided on what may, or may not occur in designated areas regarding development of mineral and energy resources. It is paramount that the agency disclose these restrictions (if any) that it intends to enforce in habitat areas. It is not so important that the final administrative "decision" be based on a more site specific analysis found in a subsequent Environmental Analysis (EA). What is necessary, however, is for the agency to provide a best estimate (and quite correctly should remain versed as only an estimate) of what will most likely occur.

Reply - This issue is addressed in part in the response to the first comment on page L-A-69 of the FEIS which states: "This FEIS does not withdraw, nor propose to withdraw, areas of locatable, salable, and leasable minerals. In summary locatable minerals will continue to be available but with even more attention to management of surface resources affecting spotted owl habitat. Salable minerals are sufficiently common or limited as to be generally available outside of designated areas or available without significantly affecting owl habitat. Leasable minerals will be, as they are now, subject to case-by-case decisions considering all environmental factors. In short, designation of areas to be managed primarily for spotted owl habitat will complicate minerals management, potentially eliminating some mining opportunities. Conversely, some owl habitat will be affected by minerals activities. The economic effect could not be predicted." The description of mineral activities coupled with the consequences section provide the decision maker with a sufficient "best estimate" to understand the implications of the decision.

[*N155] Totally omitted from the DEIS discussion are the significant problems associated with access, or the lack thereof, upon the development of mineral and energy resources. Lack of access hinders exploration and development to the extent that it effectively bans mineral and energy resources from being utilized. This negative impact is not disclosed, or even mentioned for that matter. This is despite the portrayal made in the Transportation System - Forest roads subsection (DEIS 3&4 - 126 - 127) depicting a significant decrease in the number of new and existing roads as the alternatives move from Alternative A through Alternative D.

Reply - This issue is addressed in part in the response to the comment on page L-A-70 of the FEIS which states: "The EIS discussion of transportation systems addresses possible reductions in timber-funded roads because of a reduction in timber sale activity. None of the alternatives require the closing of existing roads, nor do they prevent construction of new roads. Any proposal to close or obliterate roads for the purpose of managing for spotted owl habitat would be analyzed in a separate, site-specific project proposal." Additionally the transportation section as rewritten better refers to the process which identifies unneeded roads for closure, and also notes that closing more roads "...will reduce public access and access for certain management activities such as Pacific yew collection and fire control." (FEIS 3&4-167)

[*N156] As mentioned earlier in this comment, the Forest Service provides no economic analysis related to mineral and energy resources. In large part, the Forest Service appears to justify this economic exclusion on the basis that, "Scoping indicated little public interest in specifically quantifying these measures in this analysis" (DEIS 3&4 - 161). NFRC does not find this rational sufficient.

Reply - This issue is not appropriate to the scope of this environmental impact statement. The observation and issue raised are more appropriate to either the site-specific environmental analyses that will proceed projects and management activities, or more appropriate to the re-analysis for the Forest Plan revisions or amendments.

[*N157] The importance of economic analysis in an EIS goes far beyond just comparing the "bottom line" for each alternative. It provides a focus for many reviews to "cross check" their understanding of the document (for example, the discussion in an EIS can mistakenly infer that rather low costs will be encountered when the opposite is true). Most importantly, the generation of the economic analysis necessitates that the agency take a more critical look at the decision being made. Within the process of generating an economic analysis, the agency is forced to estimate a more precise measure of the restrictions it intends to put into place. This is pertinent information which should be available to the public, especially those most prone to be adversely affected by the decision. All too often the DEIS sinks into qualifications such as "activities may be restricted". This provides little more information than if the agency had just acknowledged that it doesn't have the faintest idea what the impacts will be.

Reply - This issue is addressed in the response to the fourth comment on page L-A-8 of the FEIS which states: "The language in the FEIS is that felt to be most accurate by the specialists and writers on the interdisciplinary team. The analysis of environmental effects is the prediction of what will happen in the future. Information on forest resources and relationships continues to accrue. The terms used in the environmental impact statement to indicate the degree of certainty or uncertainty are used by specialists who know the information well. The portrayal of the estimated degree of uncertainty will aid the decision maker in making a reasoned choice among the alternatives."

[*N158] It finally must be recognized that economic and environmental trade offs occur and must be reconciled. If energy consumption is expected to remain stable or to increase in the pacific northwest, where will the energy come from? What will be the environmental cost of finding replacement or substitute sources of energy and mineral supplies? What is the economic and environmental trade-off when considering a 3 acre rock crushing development project located within the periphery of spotted owl habitat, versus the additional haul and petrochemical usage from the next potential rock source located some 80 to 100 miles further away? Such questions should be made a more prominent part of the DEIS.

Reply - These site specific issues are not appropriate to the scope of this EIS. These observations and issues are more appropriate to either the site-specific environmental analyses that will proceed projects and management activities, or more appropriate in Forest Plan revisions or amendments.

[*N159] Page 3&4-124: Recreation

The DEIS portrayal of the impact of alternatives upon recreational opportunity is troubled by contradiction, excess and omission. From the onset, non-motorized recreation is cast as being in short supply, and roaded recreation opportunity is viewed as being in surplus.

Reply - This issue is addressed in the response to the fourth comment on page L-A-71 of the FEIS which is quoted in the reply to *N27 above.

[*N160] The DEIS states that "Most recreation activities in unroaded settings are of such a nature (few people and no facilities) they would not immediately or directly affect spotted owls." (DEIS 3&4-125). NFRC finds this statement fully contradictory, however, to the subsequent depiction that land boundary survey crews and activities "could possibly disturb nesting spotted owls", and infers the need for restrictions to be placed upon survey work. (DEIS Appendix H-3). This depiction of the impact stemming from land boundary survey work appears totally inconsequential, in comparison, to the almost 4 million visitor (12 hour) days of unroaded recreational usage along with the thousands of yearly hours expended upon primitive and semi-primitive trail construction and maintenance. In a broader sense, it appears the authors of the DEIS have inadvertently stepped beyond looking at the spotted owl and/or its habitat and have infused into the process a value system which aligns impacts based on the intent (ie. commercial activities are "bad" for the owl, non-commercial activities are OK).

Reply - The EIS language of survey line clearing with power equipment "possibly" disturbing nesting owls, (a comment that also applies to trail construction) and the EIS comment that "MOST EIS recreation activities in unroaded settings are of such a nature (few people and no facilities) they would not immediately or directly affect spotted owls" (emphasis added) are both consistent with Answer #6 in the second set of ISC-related Questions and Answers, dated January 4, 1991 and incorporated by reference in alternatives B, C, and D, which states in part: "Such activities as small hydroelectric projects, trail construction, campground construction, ski resorts, and rock pit expansion may or may not significantly affect the quality of owl habitat. These should be considered on a local basis using local knowledge to assess the effects of the proposals. When issues cannot be resolved at the local level, it may be necessary to forward the proposals along with appropriate maps to the Agency heads for further review. Guidelines for road construction in HCAs are described on page 326 of the report.

"We do not believe the following types of activities present problems for spotted owls or the ability of the HCA to function as intended: Bough cutting, fern picking, mushroom gathering, bear grass gathering, berry picking, cone harvest, snag creation (provided any blasting within 1/4 mile of nest sites is done before March 1 or after fledglings have dispersed), firewood gathering in campgrounds, seeding and fertilization projects for erosion control, and road and trail maintenance. Removal of hazard trees (defined as trees posing a risk to public safety--i.e., leaning over roads, campgrounds or other public use areas) is also permitted."

[*N161] The impact of roads upon spotted owls follows this same vein. The DEIS quotes from Thomas et.al. that roads negatively impact spotted owls because they "increase edge effect" and "remove habitat" (DEIS 3&4-125). Several countervailing relationships appear operative. First of all, most arterial roads are narrow enough to "crown over" as trees mature. This leaves an important flyway beneath that canopy for owl travel. This effect is generally positive for owl passage through dense stands of younger and mature trees. Secondly, edge effect from roads, per se, is rather minuscule in relationship to the amount of "habitat" which is theoretically used by the spotted owl. The same could be said for the relationship that roads "remove habitat". Finally, the fact that most owls have been found within calling distance of roads appears to stand in direct contradiction to the purported negative relationship. In the broad range of normal road densities found across the National Forest System, the presumed negative impact of roads upon spotted owls is vastly exaggerated.

Reply - The implication that roads are beneficial to owls is unfounded. It is relevant to further note that the observed correlation between roads and owls could be due to either to the general density of roads, or that human observers are most likely to be on roads, and not due to the absence of an effect of roads on owls.

[*N162] Significant omissions regarding multiple use trade-offs within the recreational spectrum must be recognized in an EIS. This is especially pertinent to the discussion related to the "supply" of different recreational opportunities. According to the DEIS, unroaded semi-primitive recreation opportunities are considered to be in short supply. The problems/omissions attributable to this portrayal are:

Reply - This issue is addressed in the response to the fourth comment on page L-A-71 of the FEIS which is quoted in the reply to *N27 above. In addition, the issue is addressed in the reply to *N156 above.

[*N163] 1) No economic or social "cost" is ascribed to providing this type of recreation. According to the information supplied in the DEIS, only about 1/10th of the Recreational User Days on National Forest lands fall into the unroaded (both primitive and semi-primitive) recreation category. While the DEIS fails to divulge a precise acreage assumed suitable for unroaded recreation, the amount of land suitable for primitive and semi-primitive recreation opportunities far exceeds 10% of the National Forest acreage. In essence, the cost of providing this type of recreation opportunity must be acknowledged as "highly consumptive" in terms of land allocation, which in turn bears high costs to several other multiple uses (including timber, minerals, and developed recreation). The portrayal that unroaded recreation is "non-consumptive" is erroneous when these lost opportunity costs are envisioned against the relative small percentage of use.

Reply - This comment and some of the following NFRC comments offer detailed critiques of standard definitions and methodologies. The re-examination of these (which are ancillary to the proposed action and to the understanding of the viability of the northern spotted owl) is clearly outside the scope of this EIS. Any enhanced accuracy or precision would not aid an informed choice between the alternatives of this EIS.

[*N164] 2) There is no accounting of the demographic "aging" of the American population and how that will impact ROS usage. Such a discussion is generic to formulating a discussion related to the relative supply in the ROS.

Reply - This issue is addressed in the reply to *N163 above.

[*N165] 3) The measuring "tools" used to depict recreational demand must be broadened. It should be recognized in the DEIS that the portrayal of Recreational Visitor Days (RVD - 12 hrs of visit) is inherently skewed toward recreational uses of longer duration. For example, 8 people on the ski slope for 6 hours equates for 4 RVD's. Likewise, the same 4 RVD's are attributable to 2 people who backpack for 3 hours, set up camp, and return the next day (24 hr duration). A more equitable approach beyond portraying RVD's must be developed to depict the differences between the various types of recreational usage.

Reply - This issue is addressed in the reply to *N163 above.

[*N166] 4) The DEIS equates non-motorized recreation opportunity as an expression of land allocation. Yet the potential of various sites for semi-primitive recreation opportunity are far from being fully achieved due to lack of access (both by road and trail) to seldom used portions of Wilderness Areas and other land set asides. The lack of discussion related to mitigation (more roads to access more trailheads) and management opportunities (regulating visitor flow for better dispersal) for non-motorized recreation opportunity constitutes a significant omission in the DEIS.

Reply - This issue is addressed in the reply to *N163 above.

[*N167] Page 3&4-126: Visual Resources

The DEIS infers that Visual Resources will be enhanced by the more land set aside as the Alternatives progress from A through D. While the DEIS does a good job in differentiating the similarities between natural and man caused changes upon the visual resource, more consideration should be provided related to the scale of these impacts. Invariably, management's influence from fire suppression has changed the visual landscape from a natural condition. Management constraints, such as limitations placed on even aged harvest unit size (which must be recognized as an essential driver behind passage of NFMA), also has had a prominent influence on visual resources. From a visual, as well as an overall ecological standpoint, it is time for the agency to relook [at] these harvest unit size limitations.

Reply - This issue is addressed in the reply to *N156 above.

[*N168] Page 3 & 4-126: Transportation and Roads

The DEIS provides inadequate discussion related to transportation systems issues. There are significantly more environmental effects which can be attributable to roads. Unfortunately, the DEIS focuses upon only the negative side of this issue (ie roads can increase sedimentation of streams). In addition, consideration of socio-economic consequences are entirely absent from the discussion.

Reply - The transportation discussion has been rewritten to better display the overall value and uses of roads, and no longer focuses specifically on the sedimentation effects. Economic and other effects related to road closures are better displayed with each individual resource area effected.

[*N169] The beneficial environmental aspects of roads are numerous. In addition, when placed properly in the landscape and maintained, roads seldom produce the negative effects attributed to them in the DEIS (ie. erosion/sedimentation). Roads provide access and early entry in fighting fires, assuming the agency still believes a green forest is better than a black one. In addition, roads provide a recognizable fire line. Roads likewise provide access to scientists and researchers. In essence, roads have been instrumental in our advancement of understanding forests.

Reply - As stated in the reply to *N168 above, the transportation section has been rewritten toward the balance suggested by this comment. The commenter's contention that properly placed and maintained roads seldom produce erosion/sedimentation, while being an objective of road construction, does not negate the FEIS statement that reducing roads will "reduce road-related erosion and channeling".

[*N170] The socio-economic aspects of roads must likewise be considered. Access must be recognize [sic] as being key to the development and use of all resources which flow from National Forests. Roads are necessary for timber management activities, from the culturing of trees and forest stands to the eventual harvest of timber crops. Roads are necessary for mineral exploration and development. Roads are necessary to provide hunting and fishing opportunities. Roads are instrumental in providing the public the opportunity to view wildlife. Roads are necessary for camping access. Finally, even backpacking in unroaded areas requires a road network to get to the trailhead. In essence, roads provide the primary link which allows accomplishment of the multiple use mandate of the agency.

Reply - All of these reasons certainly support the construction and maintenance of the road network within the National Forests. That network has always been arranged, however, with the appropriate mix of resource activities in mind. No one would suggest roading Wilderness areas even for the reasons cited here. Further, the alternatives described in the EIS have the effect of reducing only timber-funded roads, and only within areas managed primarily for owl habitat. The reduction in acres managed for regulated timber harvest in Alternative B amounts to 11 percent of the total area of the 17 National Forests included in the FEIS analysis. Since numerous arterial and other roads would remain within HCAs in Alternative B, the area 'negatively' affected as described by the the commenter would be limited to less. These effects are noted in individual resource sections and in the rewritten transportation section. The advantages of fewer roads are also considered.

[*N171] From a legal perspective, roads are necessary for the Forest Service to perform its ultimate function in providing multiple use. to consider otherwise places the agency not only in conflict with its legal mandate, but eventually succumbs into providing only existence values as the output of the National Forest System. While the nebulous nature of existence values are recognized in the DEIS, the defacto transition of

large portions [of] National Forests into National Parks or Wildlife Refuges is at cross purpose to the establishment of the National Forest System. It is NFRC's view that such an instrumental and major policy shift can only stem from direct Congressional action which changes or specifically exempts the agency from MUSY and NFMA. It must finally be noted from a NEPA perspective, that the closure or obliteration of existing roads must still undergo further legal compliance through a site specific decision tiered to an EA. Such compliance cannot be accomplished through a programmatic EIS.

Reply - The agency's NEPA obligations in closing roads is well understood. This issue is also addressed in the reply to *N170 above.

[*N172] Page 3&4-128: People and the Forest

The economic and community consequences of the alternatives are incorrect and poorly displayed. Table 1 below shows the estimated impacts as reported by the Forest Service in the DEIS. Table 2 displays our estimates of these and other key indicators of economic and community consequences.

Reply - This issue is addressed in the replies to *N176 through *N235 below.

[*N173] Table 1. Forest Service Economic and Community Consequences as displayed in DEIS.

Alt	Harvest <u>MMBF</u>	<u>Jobs</u>	Millions of Dollars			Payments to <u>Counties</u>
			<u>Jobs/ MMBF</u>	<u>Income</u>	<u>Return to Treasury</u>	
A	3,198	34,500	10.79	1,100	950.1	235.0
B	1,802	19,100	10.6	614	686.3	171.6
C	1,369	14,490	10.58	451	564.1	141.2
D	809	8,200	10.14	258	350.6	87.7

Reply - This statement does not lend itself to a specific response.

[*N174] Table 2. NFA's Estimated Economic and Community Consequences. (Note: Harvest levels are considered to be what is displayed in DEIS). (Dollars are in millions).

Alt	<u>Jobs</u>	<u>Jobs/ MMBF</u>	<u>Income</u>	<u>Payroll</u>	<u>Return to Treasury</u>	Total Economic <u>Impact</u>	
						<u>County Receipts</u>	<u>Impact</u>
A	57,564	9/9	1,368	340	1,151	384	N/A
B	32,463	9/9	771	192	649	216.6	1,415
C	24,642	9/9	585	145	493	164	1,856
D	14,562	9/9	346	86	291	97	2,423

Reply - This statement does not lend itself to a specific response.

[*N175] In calculating jobs in Table 2, we assume 9 direct jobs/MMBF and a multiplier of 1.0 yielding 18 direct and indirect jobs per MMBF. There is

no indication of what the Forest Service used but it is clearly too low at only 10 jobs per MMBF.

Reply - This issue is addressed in the reply to *N176 below.

[*N176] In so doing, our multiplier of 1.0 is conservative. The U.S. Fish and Wildlife Service in estimating the effects of designating critical habitat used 1.58. The State of Oregon uses a multiplier of 2.2 (see State's comments on Revised Proposal to Designate Critical Habitat, October 16, 1991).

Reply - This issue is addressed in the response to the third comment on page L-A-76 of the FEIS which states: "The description of the direct, indirect, and induced employment effects in Chapter 3&4 of the DEIS was changed in the FEIS to separate out the amount of the total employment multipliers contributed by each category."

The employment and income coefficients used in the Draft EIS were taken from the 1990 Timber Sale Program Information Reporting System (TSPRS) reports for each of the seventeen National Forests. The TSPRS report resulted in an over-all weighted average employment coefficient between 10.1 and 10.8 jobs per million board feet in the DEIS. This multiplier included direct, indirect and induced employment.

The employment coefficients used in the Final EIS were updated from those used in the draft. The final EIS used updated employment coefficients for each National Forest. The weighted average of these new coefficients ranged between approximately 15.0 and 15.3 jobs per million board feet. The change in coefficients was made in response to comments received and reflects four changes. These changes are:

- 1) Inclusion of Federal employment directly in IMPLAN (accounts for 2.3 employees per million board feet).
- 2) Use of new procedures that links estimates of direct employment per million board feet to empirical data (accounts for 1.0 jobs per million board feet).
- 3) Use of new information on the mix of uses, such as lumber and veneer, for timber harvested from National Forests (accounts for .8 jobs per million board feet).
- 4) Inclusion in IMPLAN of processing of chips, peeler cores, and other by-products from plywood and saw mills (Accounts for .3 jobs per million board feet).

Researchers have continued to study the employment and income coefficients. New information shows that the new average employment response coefficients should now range between 16.1 and 16.4 jobs per MMBF. Reasons for the increase in the job coefficients are:

- 1) Addition of metropolitan areas in the impacted area (Accounts for .2 jobs per million board feet).

2) Inclusion of additional pulp mill employment as being dependent on National Forest timber supply (Accounts for 1.0 jobs per million board feet).

This latest information on revised employment coefficients developed by Forest Service researchers was distributed as "Additional Information" in an attachment to the Errata Sheet on the FEIS.

[*N177] Also, Table 2 assumes an average westside stumpage price of \$480/MBF. It is not clear what the Forest Service used in Table 1.

Reply - Forest Service estimates of stumpage prices were displayed on page 3&4 - 133 of the DEIS and page 3&4 - 176 of the FEIS.

[*N178] It would be meaningless to compare absolute figures between Tables 1 and 2 because some are higher and some are lower depending upon the factor discussed above. Although it is worth pointing out that the figures are not too far off for the most part.

Reply - We agree that any such comparison would be meaningless.

[*N179] What is critically absent, however, is any attempt by the Forest Service to put these figures in perspective. In Table 2, using Alternative A as a baseline, the last column indicates the total economic impact of each alternative. Alternative B, the Preferred Alternative, will result in over \$1.4 billion of economic impact to the state and federal governments.

Reply - The economic effects in the DEIS and FEIS are put in perspective by comparing Alternative A (no action) to the historical levels, and then comparing the other Alternatives to Alternative A (no action).

[*N180] Another perspective is that of lost federal and county receipts. The loss of about \$500 million in federal receipts, which is the difference between alternatives A and B, may pale compared to the S & L bailout, but it is significant nonetheless.

Reply - The loss in federal and county receipts was displayed on pages 3&4 - 151 through page 3&4-158 of the DEIS and on pages 3&4-197 through 3&4-210 of the FEIS.

[*N181] What is perhaps most dramatic is the lost payroll taxes and county receipts. This is because both the states of Washington and Oregon are undergoing severe fiscal problems. Oregon, because of Measure 5, is having to explore severe cutbacks and alternate sources of revenue enhancement.

Reply - The issue of lost payroll taxes is addressed in the response to the third comment on page L-A-82 of the FEIS which states: "State and local governments may face additional revenue losses due to reduced tax revenues. The FEIS recognizes that such costs may exist, and that they change in proportion to the income effects that are displayed in the Employment and Income section of Chapter 3&4."

The impacts on county receipts was displayed on pages 3&4-151 through 3&4-158 of the DEIS and pages 3&4-203 3&4-209 of the FEIS.

Although county receipts are affected by the Forest Service alternatives, the fiscal problems currently being experience by the States of Oregon and Washington go beyond the scope of this document.

[*N182] The State of Washington is projecting nearly a \$900 million shortfall in revenues. For instance, \$272 million are approved for school construction projects but the construction fund has only \$103 million remaining. Of the county receipts, 25 percent is designated for schools. so it is obvious from Table 2 that the states will be severely impacted immediately due to harvest restrictions.

Reply - The impacts on county receipts was displayed on pages 3&4-151 through 3&4-158 of the DEIS and pages 3&4-203 through 3&4-209 of the FEIS.

[*N183] The inadequacy of estimating effects upon the economy is further evidenced by Huebner's analysis that a small portion of each state's 1989 employment is in the lumber and wood products industry. For her analysis, Ms. Heubner used only the standard industrial classification code 24. By so doing she completely ignored the pulp and paper, and the fiber board segments of the industry (SIC 26).

Reply - This issue is addressed in the response to the first comment on page L-A-76 of the FEIS which states: "The multipliers were changed to reflect the inclusion of the processing of chips, peeler cores, and other byproducts from plywood and saw mills. This change accounts for an additional 0.3 jobs per million board feet."

The estimates of direct employment used SIC Codes 8-Forestry, 9-Wildlife Management, and 26-Pulp and Paper as well as SIC code 24 in estimating the direct employment effect.

[*N184] In 1990 over 22,000 people were employed in primary pulp and paper, and fiber board facilities in Washington, Oregon, and Northern California. The average work at a pulp and paper plant has an annual income of \$42,000.00 per year for a total wage income in the three states of over \$924,000,000.00. The Forest Service has continually considered these jobs to be secondary in nature. This is simply not the case.

Reply - This issue is addressed in the reply to *N183 above."

[*N185] In 1990 55% of the fiber consumed by these mills originated on federal lands. Of that fiber approximately 65% was purchased in the form of residual chips, and the other 35% was purchased in the form of pulp logs. Therefore federal timber, and the timber sale program is vital for the existence of the western pulp and paper industry.

Reply - This issue is addressed in the reply to *N187 below.

[*N186] The DEIS states that in Washington and Oregon only 2 percent and 5.6 percent of total 1989 employment are in these industries. When compared to total covered employment, it is true these percentages are small.

Reply - This issue is addressed in the reply to *N187 below.

[*N187] What is more meaningful, however, is the contribution to the state economy by the industry. There are two measures of this: the portion of the state's basic industrial employment (export employment that is in forest products and the value added in the manufacturing process.

Reply - The lumber and wood products industry was acknowledged in both the DEIS and the FEIS to be important to the economy of Washington, Oregon, and California.

[*N188] Estimating the basic industrial or export employment

Reply - This comment does not lend itself to a specific comment.

[*N189] One tool to calculate export employment is the location of quotient. The location quotient is an economic analysis methodology that first calculates an area's ratio of employment in an industry to employment in all industries in that area. It then divides this ratio by the ratio of national employment in that industry to the total national employment in all industries. The location is used to determine if an area has more, less, or an equivalent share of national employment in a given industry.

Reply - This issue is addressed in the reply to *N187 above.

[*N190] A location quotient of 1.00 represents an equivalent share, and numbers above and below 1.00 represent more or less than the national share of employment in a given industry respectively. Industries with a location quotient of greater than 1.00 are considered export industries and produce more than what is necessary for domestic consumption. Those with location quotients less than 1.00 are then considered import industries.

Reply - This issue is addressed in the reply to *N187 above.

[*N191] By dividing the location quotient into an industry's total area employment, area supported employment is determined. When this area supported employment is subtracted from total area employment, the difference is the export employment.

Reply - This issue is addressed in the reply to *N187 above.

[*N192] Given the current interest in Oregon's economic development, it is logical that attention should be paid to the export industries. These industries contribute to the State's growth by bringing in revenue from the outside.

Reply - This issue is addressed in the reply to *N187 above.

[*N193] The tables below display the top ten three digit SIC codes in Oregon in 1989, ranked first by location quotient and then by export quotient. Tables 3 and 4 are based on non-farm payroll employment which includes both covered and non-covered employment (i.e. covered by unemployment insurance compensation laws). It does not include the self-employed.

Reply - This issue is addressed in the reply to *N187 above.

[*N194] Table 3. 1989 Top Ten SIC's With Employment Over 100 Ranked by Location Quotient.

Rank	SIC	Industry Title	Location Quotient
1	2410	Logging Camps & Logging Contractors	12.56
2	2420	Sawmills & Planing Mills	9.85
3	2430	Millwork, Plywood & Structural Members	8.43
4	3330	Primary Non Ferrous Metals	5.91
5	2030	Preserved Fruits & Vegetables	3.83
6	2490	Miscellaneous Wood Products	3.45
7	2630	Paperboard Mills	3.34
8	5490	Miscellaneous Food Stores	2.98
9	5560	Recreational Vehicle Dealers	2.96
10	7040	Organization Hotels & Lodging Houses	2.92

Reply - This issue is addressed in the reply to *N187 above.

[*N195] Table 4. 1989 Top Ten SIC's Ranked by Export Employment Quotient.

Rank	SIC	Industry Title	Export Employment
1	2430	Millwork, Plywood & Structural Members	23,071
2	2420	Sawmills & Planing Mills	20,527
3	2410	Logging Camps & Logging Contractors	11,600
4	6530	Real Estate Agents & Managers*	10,209
5	2030	Preserved Fruits & Vegetables	7,969
6	3820	Lab. Apparatus: Mech. Measuring Controls	5,699
7	4210	Trucking & Courier Service, Exc. Air	5,286
8	3670	Electronic Components & Accessories	4,569
9	5030	Lumber & Other Construction Materials	3,069
10	5330	Variety Stores	2,904

* Includes significant component of non-covered employment and therefore had to be estimated.

Reply - This issue is addressed in the reply to *N187 above.

[*N196] Table 3 displays the top ten industries ranked by location quotient. Notice that five of these top ten industries are forest products with the top-three all forest products industries. The highest location quotient in 1989 was logging because of the high log export market.

Reply - This issue is addressed in the reply to *N187 above.

[*N197] Table 4 displays the top-ten industries ranked by the export employment. In Table 2, four of the top-ten industries are forest

product industries. Three of these, Millwork, Sawmills, and Logging, were also the three highest when ranked by location quotient.

Reply - This issue is addressed in the reply to *N187 above.

[*N198] In 1989, total non-farm payroll employment was 1,245,263. Using the location quotient methodology, 14 percent of the total statewide employment was export. The top-three industries according to Table 2 account for 32 percent of the state's export employment.

Reply - This issue is addressed in the reply to *N187 above.

[*N199] There are limitations to using the location quotient methodology. It does not account for differences in productivity between areas. Nor does it account for value added by different industries.

Reply - This issue is addressed in the reply to *N187 above.

[*N200] Value Added Manufacturing

Reply - This issue is addressed in the reply to *N187 above.

[*N201] The forest products industry is a major industry when measured by value added manufacturing. According to the latest figures available from the U.S. Department of Commerce, lumber, plywood, and paper manufacturing accounted for over one-fifth of all manufacturing value added in Oregon and Washington in 1989. (See Figure 8)

Reply - This issue is addressed in the reply to *N187 above.

[*N202] On a state-by-state basis, the industry plays a slightly different role. In Oregon, it accounted for 30 percent of manufacturing value added in 1989 (see Figure 9). In Washington, this figure is about 15 percent (see Figure 10). Probably the single most overshadowing industry in Washington is the aerospace industry. As displayed in Figure 10, if the aerospace industry is excluded, the forest products industry then accounts for 24 percent of value added manufacturing.

Reply - This issue is addressed in the reply to *N187 above.

[*N203] Anyway you look at it, the forest products industry is a very significant component of the northwest economy. Consequently, policy decisions can not afford to treat the impacts upon this industry too lightly.

Reply - This issue is addressed in the reply to *N187 above.

[*N204] Figure 8. (THIS IS A FULL PAGE GRAPHIC TITLED "Gross State Product for WA & OR Lumber, Plywood, Paper" and includes Billions of 1982 Dollars and Percent of Total Manufacturing, Page 50)

Reply - This statement does not lend itself to a specific response.

[*N205] Figure 9. (THIS IS A FULL PAGE GRAPHIC TITLED "Gross State Product for OR Lumber, Plywood, Paper" and includes Billions of 1982 Dollars and Percent of Total Manufacturing, Page 51)

Reply - This statement does not lend itself to a specific response.

[*N206] Figure 10. (THIS IS A FULL PAGE GRAPHIC TITLED "Gross State Product for WA Lumber, Plywood, Paper" and includes Billions of 1982 Dollars and Percent of Total Manufacturing, Page 52)

Reply - This statement does not lend itself to a specific response.

[*N207] Non-Market Effects

Reply - This statement does not lend itself to a specific response.

[*N208] A great deal of caution must be exercised in assessing non-market effects. The effects of these alternatives on recreation, visual, fisheries and existence values are nebulous at best. Besides the fact that the techniques are not thoroughly developed and lack a broad base of understanding and support, they are often misapplied. For instance, a very common mistake is to compare the total economic benefits to the incremental economic impacts.

Reply - This issue is addressed in the response to the fourth comment on page L-A-84 of the FEIS which states: "The studies cited are theoretical, but they are published and have been subject to peer review. The practical test of the Nation's willingness to pay for spotted owl habitat protection will be determined through the legislation and policies directing the management of this habitat."

[*N209] The preferred alternative will not result in any measurable gains from increased recreation. This is because consumers have limited discretionary time and money and increasing tourism, recreation, and facilities in one area would likely shift recreational activities from elsewhere. For example,

Reply - This issue is addressed in the response to *N212 below.

[*N210] 1) A stepped up recreation program on the national forest could adversely impact private vendors of similar services (camping areas and the like);

Reply - This issue is addressed in the response to *N212 below.

[*N211] 2) More abundant camping activities could siphon away potential participants of other recreational activities;

Reply - This issue is addressed in the response to *N212 below.

[*N212] 3) More abundant camping activities on the national forests could reduce use of county and state parks.

Reply - This issue is addressed in the response to the fourth comment on page L-A-74 of the FEIS which states: "Sufficient data does not exist at this time to quantify the relationship between the level of spotted owl habitat protection and the amount of future recreation use. A narrative statement was added to the FEIS to state that a relationship may exist, but can not be quantified at this time."

[*N213] A common argument is that recreation/tourism jobs will mitigate lower harvest levels. This is not as simple as this theory's advocates would want you to believe.

Reply - This issue is addressed in the response to *N214 below.

[*N214] Recreation and tourism are mostly seasonal. Former sawmill workers would find it difficult to support themselves during the off season. Furthermore, jobs in the tourism industry are low-paying when compared to manufacturing jobs. Sawmill workers typically earn an average of \$15 - 20 per hour, or two to three times more than non-manufacturing workers in rural areas. It is unreasonable to expect a former mill worker to accept a significant reduction in living standards.

Reply - This issue is addressed in the response to the sixth comment on page L-A-75 of the FEIS which states: "It is anticipated that recreation use will increase in all alternatives. There is no evidence that setting aside areas for spotted owl management will increase recreation use above any naturally occurring levels. In addition, those people benefiting from increased recreation dollars spent in communities, will not be the same people impacted by reductions in timber harvests. Recreation related employment tends to be seasonal and typically does not pay wages comparable to those in the timber industry. The majority of unemployed timber workers will be unable to be absorbed into recreation or services industries." This issue is also addressed in the reply to *N212 above.

The social and community consequences to unemployed timber workers was discussed on pages 3&4-163 through 3&4-170 of the DEIS and pages 3&4-217 through 3&4-227 of the FEIS.

[*N215] Furthermore, development of economically significant recreation/tourism opportunities in the region are unlikely. While some new extensive recreational use is possible (quite probably at the expense of another locality), major recreational development that could be associated with job formation is unlikely. As with timber harvesting, anti-development activists have opposed viable, four-season recreational developments.

Reply - This issue is addressed in the response to *N212 above.

[*N216] In the Pacific Northwest, for example, preservationists have actively opposed plans to expand ski resort facilities needed to support rapidly expanding windsurfing activity along the Columbia River Gorge near Hood River, Oregon. There is no evidence to support the suggestion that recreational developments could offset employment losses related to timber processing and manufacturing.

Reply - This issue is addressed in the reply to *N212 above.

[*N217] Experiences subsequent to the expansion of the Redwoods National Park provide some clues for what to expect. During the late 1970's, the forest products industry had to down-size when privately-owned forest land was acquired to expand the Redwoods National park located along the north coast of California. Despite the unfulfilled promise of an extraordinary increase in visitation to the Park and the efforts of several federal grant programs, this area, according to Professor Gilless at the University of California - Berkeley, continues to suffer from chronic unemployment.

Reply - This issue is addressed in the reply to *N212 above.

[*N218] The other non-market values referred to in the DEIS include visuals and fisheries though some would include others such as watershed protection; Native American heritage values; soil stability; protection of biological diversity; protection of wildlife habitat values; protection of old growth ecosystems; and, "existence" values for spotted owl and its habitat. The economic literature with respect to non-use values is in its infancy, and these benefits are extremely difficult to measure. It is also a difficult matter to assess the relative difference in these benefits between the current prospective management direction and that implied by the preferred alternative.

Reply - This issue is addressed in the response to the sixth comment on page L-A-84 of the FEIS which states: "The text has been changed in the FEIS. The effects are addressed in qualitative terms in the fisheries and non-market contribution sections of the EIS."

This issue is also addressed in the response to the first comment on page L-A-85 of the FEIS which states: "These effects are discussed narratively in the EIS. However, sufficient data does not exist at this time to quantify the relationship between the level of spotted owl habitat protection and the amount of economic benefits associated with these resources. The narratives in the EIS state that a relationship may exist, but cannot be quantified at this time."

[*N219] To date, there has been no evidence to substantiate the hypothesis that preserving more acres of forest will increase recreation and other non-market goods of services.

Reply - This issue is also addressed in the reply to *N212 and *N218 above.

[*N220] Contingent valuation techniques to quantify non-market and/or non-use benefits (i.e., existence values) can be very misleading if not carefully designed. Contingent valuation surveys may not be structured to supply respondents with sufficient information to make rational and informed judgements. In the case of the spotted owl, including the fact that the spotted owls are not exclusively found in old growth, that spotted owl habitat is already protected where it exists in designated wilderness areas, and that the costs and employment impacts associated with a habitat reservation program would be severe are often overlooked

in these types of surveys. (See attached report by Dr. William McKillop.) Another common error is to include consumer surplus from increased recreation in an analysis of a stable and abundant supply of timber and with the knowledge that a unique rural way of life in much of the Northwest can be maintained. The bias resulting from the failure to include a complete discussion of consumer surplus is a serious flaw in any assessment of benefits.

Reply - This issue is addressed in the response to the fourth comment on page L-A-84 of the FEIS which states: "The studies cited are theoretical, but they are published and have been subject to peer review. The practical test of the Nation's willingness to pay for spotted owl habitat protection will be determined through the legislation and policies directing the management of this habitat."

[*N221] Existence values can also be applied to timber-related benefits. For instance, "bequests to future generations" is often referred to as a non-use value of a proposal. However, it should be recognized that reductions in timber output diminished other socio-economic bequests to future generations such as adequate stocks of building materials at reasonable prices (for affordable housing) and better environmental quality at the global level.

Reply - This issue is addressed in the response to *N222 below.

[*N222] For example, the reduced availability of timber in the Pacific Northwest will eventually lead to an increase in the use of wood substitutes that cause considerable more pollution and use considerably more energy. Significant reductions could also lead to increased timber harvesting in Canada and other parts of the world, including tropical forests. As noted above, failure to include a balanced analysis results in a biased conclusion which renders the results inadequate.

Reply - Existence values may exist for timber-related benefits, however no studies have been completed to date.

[*N223] The Forest Service should also evaluate the environmental trade-offs resulting from the significant reduction in availability of forest products. Bowyer, for example, observes that producing less timber will result in the use of nonrenewable resources requiring a "massive substitution of materials that are already largely imported and which will result in more serious global environmental consequences than the harvesting of timber."² If we end up importing wood to sustain our current needs we will stimulate production from much more environmentally sensitive areas. Furthermore, Bowyer asserts that "When seeking to protect the environment, the lack of global perspective can and does lead to what amounts to irresponsible and unethical regional environmentalism."

Reply - Resolution of this issue is beyond the scope of this EIS. In addition, little information exists to quantify the relationship between increased importation of wood products and environmental damage in other locations. However, the predicted level of imports was displayed on pages 3&4-131 and 3&4-132 of the DEIS and pages 3&4-173 and 3&4-174 of the FEIS.

[*N224] Without exception, the energy to extract, process and deliver substitute materials is far greater than for wood products. Peter Koch examined the energy and carbon dioxide trade-offs associated with alternative scenarios for managing private and public lands in the 3-state spotted owl region and found that for each billion board feet (Scribner) of annual harvest reduction, consumers would be forced to use alternative building materials -- that is more steel, aluminum, concrete, brick and plastics -- and, as a result, an additional 7.5 million tons of carbon dioxide⁴ would be released into the atmosphere per billion board feet reduction.

Reply - This issue is beyond the scope of this EIS.

[*N225] In conducting its analysis, the Forest Service must discard the incorrect assumption that automation will continue to be a major cause of job loss within the industry. Enclosed is a letter prepared by Professor Brian Greber of Oregon State University to Senators Gorton, Hatfield and Packwood concerning the issue of automation and its impacts on employment in the Pacific Northwest. Professor Greber states that the rate of job loss resulting from automation during the 1980's is not an appropriate guide for the future.

Reply - This issue is addressed in the response to the first comment on page L-A-74 which states: "This environmental impact statement recognizes and states that technological improvements have reduced the number of jobs generated per million board feet. Projected future improvements consistent with the 1989 RPA Assessment were factored into the analysis in two forms, 1. a reduction in per unit production costs for final products and 2. changes in the amount of overrun. However, no attempt was made to convert these projected gains in efficiency into a corresponding change in the number of jobs generated per million board feet processed. Such projections would be speculative and beyond the scope of the document. The emphasis is on change in employment and income resulting from changes in future timber supply from the National Forests. Furthermore, any future gains in efficiency would have a similar affect on all alternatives."

[*N226] More specifically, the report finds:

Reply - This comment does not lend itself to a specific response.

[*N227] 1) The costs and benefits of technological change in the industry are perhaps some of the most widely misunderstood and misrepresented factors in the current debate over natural resource management and the fate of timber dependent communities in the Pacific Northwest.

Reply - This issue is addressed in the reply to *N225 above.

[*N228] 2) Few Pacific Northwest producers would have survived the past recession without either increasing their efficiency or confronting the workers with massive wage cuts.

Reply - This issue is addressed in the reply to *N225 above.

[*N229] 3) Rather than looking at labor productivity changes as having displaced 24% of the work force, it may be more appropriate to look at the efficiency gains as having saved 76% of the work force.

Reply - This issue is addressed in the reply to *N225 above.

[*N230] 4) Many of the large gains in labor productivity were extracted during the 1980's. The concentration in more efficient mills already has shaken out many of the inefficient producers.

Reply - This issue is addressed in the reply to *N225 above.

[*N231] 5) Technological changes during the 1990's will focus on : 1) extending the raw material input through material saving technological change, 2) limiting the debt burden by slowing the substitution of capital for labor, and 3) increasing progress on engineered and remanufactured wood products. These changes will likely serve to increase the employment per million board feet of wood harvest in the Pacific Northwest.

Reply - This issue is addressed in the reply to *N225 above.

[*N232] Other factors ignored in economic and community analysis

Reply - This issue is addressed in the replies to *N233 and *N235 below.

[*N233] Domestic Production

The Pacific Northwest produces approximately 12% of the pulp and paper products used in the United States each year. A reduction in federal timber harvests in the West, and the resulting reduction in western pulp and paper production can only be offset by increased production in other regions, or through importing more paper products.

Reply - Domestic production of wood products is displayed on pages 3&4-130 and 3&4-131 of the DEIS and pages 3&4-171 and 3&4-172 of the FEIS.

[*N234] US Consumption of Paper

Total United States consumption of paper products is rising at an average rate of 4% per year. In 1990 the average American used 640 lbs. of paper. Even with increased recycling efforts (industry goal of 40% by 1995) the demand and need for virgin fiber will continue to rise.

Reply - We agree that the consumption of all wood products will continue to increase. The consumption of Lumber, Plywood, and Oriented Strand Board (OSB) is displayed on Pages 3&4-132 and 3&4-133 of the DEIS and page 3&4-174 of the FEIS.

[*N235] Fiber prices

Traditionally the fiber (chips and pulp logs) costs in the region have been higher than [sic] in other regions of the country. These higher costs have always been offset by the low power costs in the PNW, and the proximity to major western markets. However at the present timber, [sic] western fiber costs have reached a point where they are well over twice the cost of other regions. If federal timber supplies are further tightened, fiber costs will continue to escalate, until the western industry is no longer able to compete in the market place.

Reply - The issue is addressed in the response to the second comment on page L-A-81 of the FEIS which states: "Changes in timber harvest levels from the National Forests under these alternatives would only moderately affect national prices for softwood lumber and plywood. National and international competition in final product markets should be sufficient to prevent large increases in national prices for manufactured wood products. On a regional level however, the reductions in available timber supply will have a more pronounced impact on local harvest values due to a smaller market size. Typically, unprocessed logs are not transported nearly as far as finished products, thus they have a more limited market size. It is anticipated that the structure of the wood products industry on the west coast will continue to change, including the closing of less efficient firms."

Both the DEIS and FEIS recognized that increased stumpage prices in the Pacific Northwest would result in a shifting of production to other Regions of the Country and to foreign countries, primarily Canada.

Footnotes:

¹ Gilless, J. Keith, "Economic Effects in California of Protecting the Northern Spotted Owl", University of California, California, 1990.

² Bower, Jim L., "Global Climate Change, Material Needs, and Environmental Quality", A paper presented at the Conference on Forest and Global Change, June 11-12, 1991 in Arlington, Virginia. St. Paul, MN: College of Natural Resources, University of Minnesota.

³ Ibid.

⁴ Koch, Peter, "Wood vs. Non-Wood Materials in U.S. Residential Construction - Some Energy-related International Implications", Working Paper prepared for the Center for International Trade in Forest Products (CINTRAFOR), College of Forest Resources, University of Washington, Seattle, Washington, 1991.

RESPONSE TO COMMENTS FROM WASHINGTON COMMERCIAL FOREST ACTION COMMITTEE

The following are comments received from the Washington Commercial Forest Action Committee on the Draft Environmental Impact Statement for the Northern Spotted Owl, dated December 20, 1991. Each comment is numbered and followed by a response.

[*W1] Please receive these comments in regard to the DEIS on management of the Northern Spotted Owl in the National Forests. I believe that none of the alternatives offered in this document allow for appropriate management of either the spotted owl or the national forests of Region 6.

Reply - This comment does not lend itself to a specific response.

[*W2] Single species management, in concept, is in contradiction with the integrated functions of nature. No holistic management opportunity is offered in the DEIS. No explanation is given as to historic precedents in regard to clamorous [sic] natural events and their impacts on owl populations. No comparative data appears to be available on population fluctuations.

Reply - This issue is addressed in the response to the last comment on page L-A-31 of the FEIS which states: "The chance of large losses of habitat due to natural events is always present and is discussed in Chapter 3&4. However, large areas that held reserves of spotted owls in the past and served as reservoirs of owls to recolonize impacted areas are not present today due to human activities and habitat manipulation. Consequently, designated areas managed primarily for spotted owl habitat will serve not only as long-term spotted owl reproductive centers but as reservoirs of spotted owls for designated areas that might go through natural habitat fluctuations."

In the FEIS a section was added, Chapter 3&4-19, on historic estimates of spotted owl nesting, roosting and foraging habitat and the contribution of natural events to the amount and distribution of nesting, roosting and foraging habitat.

[*W3] I am appalled that such far reaching socio-economic impacts are being initiated on the basis of such incomplete science.

Reply - The science, while still being developed, is complete enough for the purpose of making a decision. Further this issue is addressed in the response to the 1st comment on page L-A-23 of the FEIS which states: "The ISC Strategy for the northern spotted owl is scientifically credible for several reasons. First, the scientific method was used to develop the strategy. Strategies were tested and adjusted with the best available quantitative data and other information including modeling. Second, each member of the committee had credentials, experience, and reputations appropriate to the task. Third, published literature, reports and ongoing research was reviewed and considered when developing the strategy. Finally, the report was subject to thorough peer review by professionals selected by the following societies: The Wildlife

Society, Society of American Foresters, Society for Conservation Biology, The American Ornithologists' Union, and The Ecological Society of America (USDA Forest Service 1991a, Question #15)."

[*W4] In conclusion, it is my suggestion that a successful management prescription must accommodate the broad spectrum of impacts that it initiates. Proactive techniques should be employed to manually enhance and develop habitat areas, efforts should begin on breed and release projects, and these activities must facilitate the continued multiple use of our national forests.

Reply - Artificial propagation and artificial habitat development are available options. However this type of intensive hands-on management is usually used as a last resort to save a species from extinction. Such measures are viewed as high risk because of the amount and frequency that individuals of the species would have to handled. Without adequate amounts of quality habitat available to transfer northern spotted owls into, success of introduction and reintroduction programs is limited. Another concern is the lack of available owls for such action. If habitat is not available in sufficient amount and distribution then spotted owl populations are expected to be low in all areas and thus there will not be surplus owls for transfers. The risk to the species, balanced with the low likelihood of success does not result in a high priority for action.

Protecting habitat and populations in the wild is the first step to recovering a species from threatened or endangered status. Silvicultural manipulations of habitat have not been demonstrated to be beneficial to northern spotted owls. However, if silvicultural manipulations are conclusively demonstrated to enhance or provide spotted owl habitat then this type of management could be incorporated through the adaptive management process.

RESPONSE TO COMMENTS FROM WASHINGTON CONTRACT LOGGERS ASSOCIATION

The following is testimony received from George Kirkmire, representing Washington Contract Loggers Association at a public hearing following release of the draft. Each comment is numbered and followed by a response.

[*G1] The Washington Contract Loggers Association is vehemently opposed to the adoption of the Jack Ward Thomas report as the U. S. Forest Service's conservation strategy of choice in solving the Northern Spotted Owl crisis here in the Pacific Northwest.

Reply - This comment does not lend itself to a specific response.

[*G2] We do not, and will not accept the notion that the ISC report is the best possible science available concerning the Northern Spotted Owl.

Reply - This issue is addressed in the response to the 1st comment on page L-A-23 of the FEIS which states: "The ISC Strategy for the Northern spotted owl is scientifically credible for several reasons. First, the scientific method was used to develop the strategy. Strategies were tested and adjusted with the best available quantitative data and other information including modeling. Second, each member of the committee had credentials, experience, and reputations appropriate to the task. Third, published literature, reports and ongoing research was reviewed and considered when developing the strategy. Finally, the report was subject to thorough peer review by professionals selected by the following societies: The Wildlife Society, Society of American Foresters, Society for Conservation Biology, The American Ornithologists' Union, and The Ecological Society of America (USDA Forest Service 1991a, Question #15)".

[*G3] Consider these points that were brought out in a document called a Facade of Science, an analysis of the Jack Ward Thomas Report, based on sworn testimony of the members of the Thomas committee, prepared by Mark Rutzek during the Portland Audubon Society v Luhan and Seattle Audubon Society v Robertson hearings.

Reply - See the comment to *G4 below.

[*G4] The sworn testimony of these scientists reveals that the ISC strategy is primarily the product of the subjective personal judgment of the members of the committee, rather than an objective scientific product based on verifiable facts, reliable data or recognized scientific theory.

Reply - This issue is addressed in the response to the 2nd comment on page L-A-23 of the FEIS which states: "The Forest Service Accepts the ISC Strategy because it is a scientifically credible strategy for the conservation of the northern spotted owl. The "Facade of Science" is the most commonly referenced document that criticizes the ISC Strategy as not being objective science. The "Facade of Science" states, "This does not mean that the ISC Strategy is

necessarily wrong or is fatally flawed". The "Facade of Science" is founded on selective quotations taken out of context from depositions given by five members of the Interagency Scientific Committee. In addition, the "Facade of Science" did not identify the authors so their credentials are not known." This concern is also addressed in the reply to *G2 above.

[*G5] The ISC did not keep any minutes, notes, or other documentation of its discussions in the period of October 1989 through March 1990, during which it prepared its conservation strategy. Thus, it is impossible to recreate the actual analytical process which led to the ISC strategy. Further, the committee did not retain the raw data which it analyzed in developing the strategy. Rather, each committee member that supplied data, simply retained the data in his own office. The committee members made no effort to verify which [of] each other's data was correct, but simply accepted it as true.

Reply - This concern is also addressed in the reply to *G2 and *G4 above.

[*G6] In the absence of documentation of the ISC deliberations, the only available source of information is the recollections of the committee members, describing the process followed by the committee. The ISC members who testified uniformly identified four sources of information, which were relied on in the development of the strategy, empirical data, scientific theory, computer models, and professional judgment.

Reply - This concern is also addressed in the reply to *G2 and *G4 above.

[*G7] Additionally, the data relied on by the committee, came from studies of birds living on islands off the coast of England and California. None of the studies were of birds living in forests like those of the Northwest. And on and on it goes.

Reply - This concern is also addressed in the reply to *G2 and *G4 above.

[*G8] It does not take a rocket scientist to grasp what is developing here. This is an environmental hoax of the greatest magnitude being foisted upon the American public. Can we afford to throw countless thousands of people out of work, lose billions of dollars in revenue and tie up millions of acres of the world's most productive timber land all over professional judgment, I think not.

Reply - This comment does not lend itself to a specific response.

[*G9] Before such draconian measures are taken to protect the spotted owl, the Forest Service should consider the fact that here in Washington, the ISC assumed that there were only 226 pairs of owls. But one year later, the Washington Department of Wildlife verified 539 pairs and territorial single owls with more being found on a daily basis. Overall across the region, there are nearly 2,400 pairs of owls, and these owls are being found not just in old growth, but in managed forests, as well. How many owls will it take to recognize the fact that it is not endangered at all.

Reply - This issue is addressed in the response to the 1st comment on page L-A-31 of the FEIS which states: "Recent surveys have identified additional

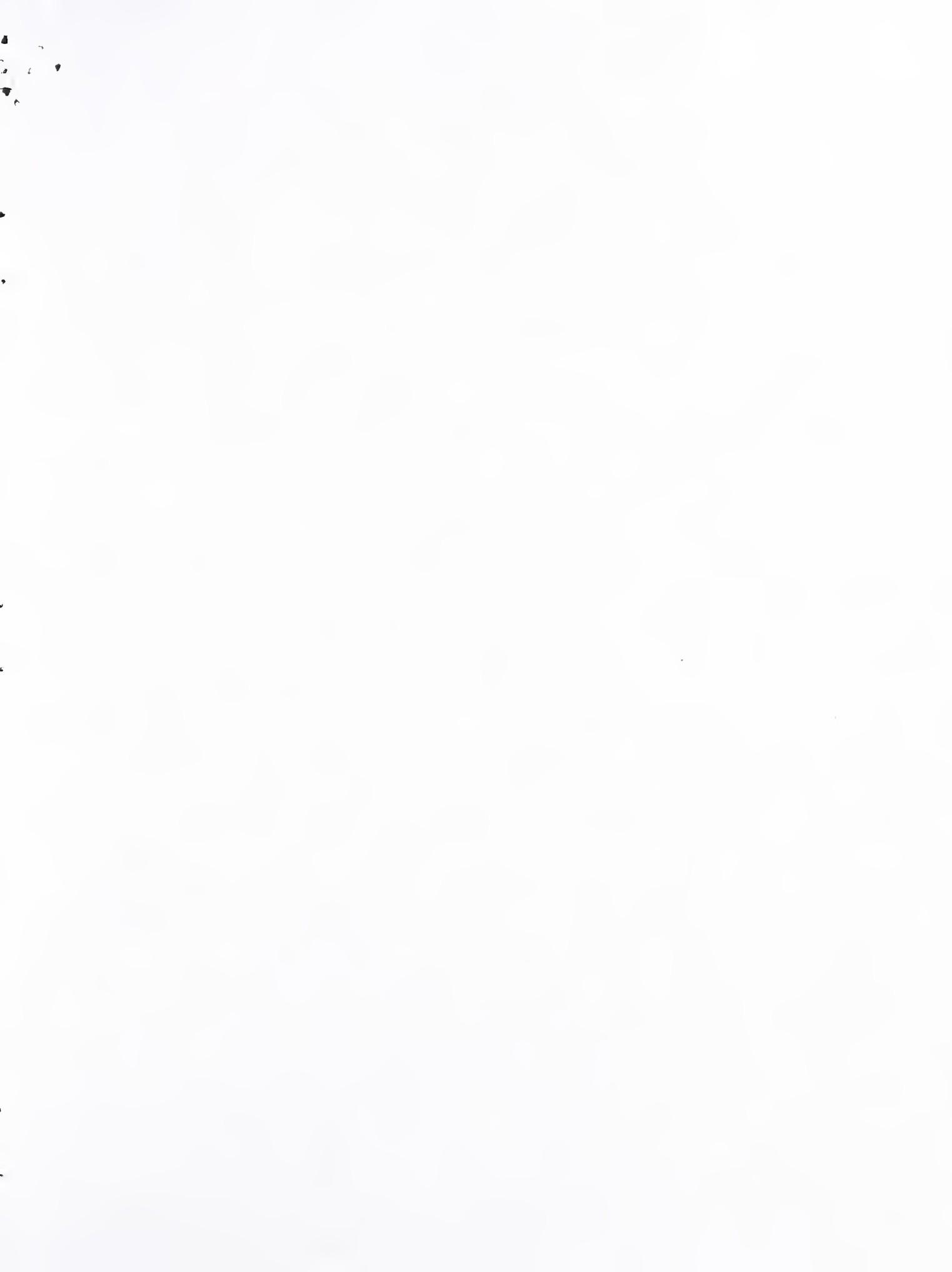
spotted owls due to an increase in survey efforts. There is no information that indicates the population size of northern spotted owls has increased. This is based on two lines of evidence. First, acreage of nesting, roosting, and foraging habitat has decreased when compared to historic levels. Second, analyses of data from five northern spotted owl demographic study areas in Washington, Oregon and northern California indicate that spotted owl populations are declining in all five areas. These studies are designed to show changes in owl numbers through application of rigorous scientific procedures." This issue is also addressed in the last comment on page L-A-29 of the FEIS which states: "The basic conclusion that northern spotted owls prefer habitats with structural characteristics usually found in older forest has not changed and has been consistently supported by research since the mid-1970's. As survey intensity has increased over the last several years more northern spotted owls have been found in fragmented and second-growth forests. There are no studies that support the assumption that spotted owls thrive in fragmented forests, "thrive" being equated with long-term pair existence with high offspring survival. Forests that are inhabited by spotted owls have varying degrees of fragmentation. Research has shown that as owl habitat within home ranges decreases, home range size of spotted owls increases. Usually as habitat decreases it is accompanied by an increase in fragmentation."

[*G10] I offer to you that the ISC recommendations were prepared by scientists, acting as hired guns on behalf of big government, to further their ultimate political agenda of a cessation of all timber harvesting on public lands. The Forest Service should ignore this report and get back to the business of managing our public lands under the multiple-use doctrine.

Reply - This comment does not lend itself to a specific response.

[*G11] Additionally, I'd also like to point out how difficult things really are in the timber industry once an employee loses his job. There's a gentleman over here, Mr. Dierker who testified at the U.S. Fish and Wildlife hearing in August. He was an out of work timber worker then. Evidently, he's still unemployed and hasn't been retrained. So we can get an idea how difficult things are. Thank you.

Reply - This comment does not lend itself to a specific response.





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